ENGIN. LIBRARY

AUGUST 1954

VOLUME 3, NUMBER 8

# Battelle Technical Review

IN THIS ISSUE:

Ceramic Materials for Jets

# PHYSICAL CHEMIST

CARROLL F. POWELL

The name of Carroll F. Powell has been linked with vapor-phase deposition of metals since he joined Battelle in 1944. During that decade, he has seen the demand for vapor-deposited metal coatings expanded at a rapid rate. Industries have found use for such coatings in protecting materials from the effects of high temperature and corrosion. More recently, investigations have shown that vapor deposition may be employed in preparing semiconductor devices, in the protection of commercial metals, and in the decorative coatings of materials. Technologists also employ the techniques for preparing high-purity metals.

Carroll's investigations in the field reflect these developments. Some of his more significant studies have been on: (1) a process for applying tantalum and niobium coatings—to make corrosion-resistant chemical ware; (2) a process for siliconizing molybdenum—to protect it from high-temperature oxidation; (3) vapor-phase deposition of carbides, nitrides, borides, silicides, and oxides—to protect materials exposed to high temperatures; (4) deposition of metals on glass and on other metals—for decorative and protective purposes; and (5) the preparation of high purity metals—for use in research investigations.

Before his association with Battelle, Carroll served as an analytical chemist with Basic Magnesium, Inc. Earlier he had received a B. S. degree from Adrian College and an M. S. in physical chemistry from the University of Michigan.

Carroll has reported many of his investigations in technical papers before professional societies. He is coauthor of *Vapor-Plating*, a monograph to be published in the fall under the auspices of the Electrochemical Society.

His home is Carroll's major interest away from Battelle, and his three children, all under seven, are a good reason for that interest. They also provide a good excuse to practice his favorite hobby of photography.

# BATTELLE TECHNICAL REVIEW ABSTRACTS

## ABSTRACT INDEX


Aeronautical Engineering . . . . . 489a

Agriculture . . . . . 489a

Biochemical and Biophysical Research . . . . . 493a

Ceramics and Concrete . . . . . 495a

Chemical Engineering . . . . . 498a

Chemistry—Analytical and Inorganic . . . . . 500a

Chemistry—Organic . . . . . 502a

Chemistry—Physical . . . . . 505a

Coatings . . . . . 507a

Corrosion . . . . . 509a

Electrical Engineering . . . . . 510a

Electrochemistry and Electroprocesses . . . . . 512a

Electronics . . . . . 514a

Engineering Economics . . . . . 516a

Fluid Mechanics . . . . . 517a

Food Technology . . . . . 517a

Fuels and Combustion . . . . . 518a

Geology and Mineralogy . . . . . 519a

Geophysics . . . . . 520a

Graphic Arts . . . . . 520a

Heat Power . . . . . 521a

Information—Preparation and Dissemination . . . . . 521a

## ABSTRACT INDEX (Continued)


INSTRUMENTATION AND LABORATORY APPARATUS . . . . . 522a

LUBRICATION AND FRICTION . . . . . 524a

MECHANICAL ENGINEERING . . . . . 525a

METALLURGY . . . . . 527a

METALS—EXTRACTION AND REFINING . . . . . 529a

METALS—FINISHING, POLISHING, AND CLEANING . . . . . 530a

METALS—FOUNDRY PRACTICE . . . . . 531a

METALS—HEAT TREATMENT . . . . . 532a

METALS—MECHANICAL AND PHYSICAL PROPERTIES . . . . . 533a

METALS—MECHANICAL WORKING . . . . . 537a

METALS—METALLOGRAPHY, TRANSFORMATIONS, AND STRUCTURES . . . . 538a

METALS—POWDER . . . . . 541a

MINING ENGINEERING . . . . . 542a

NONDESTRUCTIVE TESTING . . . . . 542a

NUCLEAR PHYSICS, NUCLEONICS, AND RADIATION . . . . . 542a

OPERATIONS RESEARCH AND MANAGEMENT ENGINEERING . . . . . 544a

ORE AND MATERIALS BENEFICIATION . . . . . 545a

PHYSICS . . . . . 546a

PLASTICS . . . . . 548a

POLLUTION AND WASTES . . . . . 550a

RUBBER AND ELASTOMERS . . . . . 551a

SPACE HEATING AND CONDITIONING . . . . . 552a

TEXTILES AND FIBERS . . . . . 552a

WELDING AND JOINING . . . . . 553a

WOOD AND FOREST PRODUCTS . . . . . 554a

# BATTELLE TECHNICAL REVIEW ABSTRACTS

Volume 3, Number 8 August 1954


***Asterisks mark items that may be used in the Battelle Library only. None of the unbound materials listed below are available for interlibrary loan.**

## AERONAUTICAL ENGINEERING

**10551* The Flow Past Elliptic-Nosed Cylinders and Bodies of Revolution in Supersonic Air Streams.** D. W. Holder and A. Chinneck. *Aeronautical Quarterly,* v. 4, Feb. 1954, p. 317-340.

Flow at zero incidence examined at free stream Mach numbers between 1.42 and 1.82. Pressure distribution measured at surface. Graphs, photographs. 16 ref.

**10552 Laboratory Simulation of Kinetic Heating.** W. H. Horton. *Aircraft Engineering,* v. 26, May 1954, p. 138-144.

Methods of simulation which may be used simultaneously with normal loading in structural tests of aircraft or components. Tables, graphs. 80 ref.

**10553 The Elementary Theory of Aero-Elasticity. III. Flutter of Control Surfaces and Tabs.** *Aircraft Engineering,* v. 26, May 1954, p. 145-153.

Nature of flutter, methods of calculation, and avoidance of the problem. Graphs, diagrams.

**10554*** (Calculation of the Effect of Thickness on Symmetrical Wings in Zero-Lift Position by Analogy With Eelectric Resistance.) **Calcul par analogie rhéoélectrique de l'effet d'épaisseur sur des ailes symétriques a la portance nulle.** René Duquenne and Charles Grandjean. *Comptes rendus,* v. 238, no. 15, Apr. 12, 1954, p. 1564-1566.

Reduced-scale wing model of insulating materials placed in a basin with resulting different electric potentials forms basis for analogy. Diagrams. 2 ref.

**10555 De-Icing With Sprayed Metal.** *Electroplating and Metal Finishing,* v. 7; *Metal Spraying,* v. 4, Apr. 1954, p. 159, 161-163.

Theory, operation, and production of Napier Heating Mat on aircraft. Alloy coating is sprayed on a resin base. Graph, photographs. 4 ref.

**10556* Rotary Wing Aircraft Development.** Everett B. Schaefer. *Engineering Journal,* v. 37, May 1954, p. 570-575, 585.

Historical development, present machines, and predictions for future. Photographs, diagrams, tables.

**10557 Wing-Body Interference at Subsonic and Supersonic Speeds—Survey and New Developments.** H. R. Lawrence and A. H. Flax. *Journal of the Aeronautical Sciences,* v. 21, May 1954, p. 289-324, 328.

Critical survey of available theories, simplified analysis methods for design, and experimental results. Graphs, diagrams. 56 ref.

**10558 Generalizations of the Inversion Formula of Thin Airfoil Theory.** H. K. Cheng and N. Rott. *Journal of Rational Mechanics and Analysis,* v. 3, May 1954, p. 357-382.

Applies to theory of two-dimensional flow of an ideal fluid past a thin airfoil. 13 ref.

**10559*** (Do Models Cross the Sound Barrier in Supersonic Wind Tunnel?) **Les maquettes traversent-elles le mur du son en soufflerie supersonique?** Jean J. Ginoux. *Revue universelle des mines,* v. 10, ser. 9, no. 4, Apr. 1954, p. 85-92.

Apparatus measures Mach number. Photographs, diagrams, graphs.

**10560* Aeronautical Acoustics. In Particular, Jet Noise.** *Royal Aeronautical Society, Journal,* v. 58, Apr. 1954, p. 221-254; disc., p. 254-260.

Includes "Jet Engine Noise", E. J. Richards; "Engine Noise", F. B. Greatrex; "Aerodynamic Noise", G. M. Lilley; "Noise Associated With Supersonic Flight", C. H. E. Warren; "Measurement of Noise on the Ground From Aircraft in Flight", N. Fleming; and "Ground-to-Ground Noise", J. D. Hayhurst.

**10561* Stability and Control in Aircraft Design.** J. C. Wimpenny. *Royal Aeronautical Society, Journal,* v. 58, May 1954, p. 329-348; disc., p. 348-360.

Practical design to achieve desired handling qualities; suggests more important gaps in present-day knowledge of subject. Diagram, graphs, photographs. 4 ref.

**10562* A Method for Determining the "Safe" Life of an Aircraft Wing From Fatigue Test Results.** A. P. Kennedy. *Royal Aeronautical Society, Journal,* v. 58, May 1954, p. 361-366.

Assumes that fatigue tests results can be represented by a log-normal distribution. Statistics used to determine the probability of a wing boom being capable of withstanding a particular number of reversals to failure. Graphs, tables. 4 ref.

*Books and Miscellaneous Publications*

**10563 Selecting Materials for Aircraft Accessories.** R. C. Gibbons. Paper from MATERIALS FOR PRODUCT DEVELOPMENT 1953. p. 256-258; disc., p. 259-265. Clapp & Poliak, Inc., N. Y. (TA403 M41.3)

Emphasizes importance of strength-per-wt. ratio and diversity of materials considered.


***See also:***
**11121** (computers for aircraft)
**11228** (flight beyond earth's atmosphere)


## AGRICULTURE

**10564* An Evaluation of Borate and Chlorate Herbicides.** J. D. Stone and L. M. Smith. *Agricultural Chemicals,* v. 9, May 1954, p. 50 + 4 pages.

Includes graphs, table. 14 ref.

**10565* Supply-Utilization of Agricultural Food Products.** Marguerite C. Burk and Martin J. Gerra. *Agricultural Economics Research,* v. 6, Apr. 1954, p. 33-41.

Preliminary report explores some uses; suggests further problems. Tables.

**10566* Experience in Introducing Granulated Fertilizers Under the Cotton Plant.** (Russian.) V. A. Pisemskaia. *Agrobiologiia,* 1953, no. 6, Nov.-Dec., p. 17-28.

Effectiveness of fertilizers. Tables.

## *Agriculture*

**10567* Flower Initiation in the Alaska Pea. II. Chemical Vernalization.** A. C. Leopold and Frances S. Guernsey. *American Journal of Botany*, v. 41, Mar. 1954, p. 181-185.

Analysis of initiation by auxin treatment of seeds followed by low temperature exposure. Graphs. 14 ref.

**10568* Sulfur-Selenium Antagonism. I. Antimetabolite Action of Selenate on the Growth of Chlorella Vulgaris. II. Antimetabolite Action of Seleno-Methionine on the Growth of Chlorella Vulgaris.** Alex Shrift. *American Journal of Botany*, v. 41, Mar. 1954, p. 223-230; Apr. 1954, p. 345-352.

Confirms sulfate and selenate as competitive antagonists in metabolism process. Conditions seleno-methionine inhibited cell division but not growth in cell size or dry weight. Graphs, tables. 47 ref.

**10569* The Uptake and Translocation of Yttrium by Higher Plants.** J. H. Rediske and A. A. Selders. *American Journal of Botany*, v. 41, Mar. 1954, p. 238-242.

Effects of pH and concentration in several species of plants. Table, graphs. 8 ref.

**10570* Effects of Soil Moisture Stress on Carbohydrate Development and Growth in Plants.** Dorothy H. Woodhams and Theodore T. Kozlowski. *American Journal of Botany*, v. 41, Apr. 1954, p. 316-320.

Appreciable moisture stress is imposed on roots before moisture is depleted to permanent wilting percentage and each developed stress will effect changes in metabolic status of plant as indicated by differences in carbohydrate reserves. Tables. 20 ref.

**10571* Effects of Tetramethylthiuram Disulfide on Metabolism of Fusarium Roseum.** Hugh D. Sisler and Carroll E. Cox. *American Journal of Botany*, v. 41, Apr. 1954, p. 338-345.

Metabolic and morphologic changes in conidia during germination and early stages of mycelial growth. Effects on respiration, fermentation, germination, and decomposition of fungus cells by compound. Graphs, table. 15 ref.

**10572* Physiologic Races of the Brown Rust of Brome Grasses.** J. Bean, P. W. Brian, and F. T. Brooks. *Annals of Botany*, v. 18, new ser., Apr. 1954, p. 129-142.

Cultures were isolated and maintained as single-spore strains. Five races were characterized. Tables. 17 ref.

**10573* The Use of the Infra-Red 'Image Converter' Viewing Apparatus in the Study of the Effects of Localized Wounds on the Growth of Etiolated *Avena* Seedlings.** C. L. Mer. *Annals of Botany*, v. 18, new ser., Apr. 1954, p. 157-169 + 1 plate.

Effect of injuries to coleoptile tip, coleoptilar node, and stem apex. Photograph, tables, diagrams. 17 ref.

**10574* Nutrient Balance Affects Corn Yield and Stalk Strength.** Flake L. Fisher. *Better Crops With Plant Food*, v. 38, Apr. 1954, p. 15-17, 40.

Need for proper balance between nutrients in applied fertilizer. Photographs, tables.

**10575* Tung Culture Finds a Place in South Mississippi.** H. B. Vanderford. *Better Crops With Plant Food*, v. 38, Apr. 1954, p. 18-24, 48-51.

Soils, fertilizers, and yields. Tables, photographs, map, diagrams. 5 ref.

**10576* Variation of Organic Acid Content in Leaves and Tubers of Potato.** (Russian.) A. K. Minina. *Biokhimiia*, v. 18, no. 6, Nov.-Dec., 1954, p. 718-724.

Citric and malic acid content. Tables, graphs. 24 ref.

**10577* Effect of 2,4-D on Translocation and Accumulation of Food Materials in the Bean Plant.** Ralph Garren, Lemar F. Remmert, and Nancy L. Lawrence. *Botanical Gazette*, v. 115, Dec. 1953, p. 105-121.

Morphological observations and chemical analyses show change of carbohydrates and total dry matter in various plant organs. Photographs, tables. 15 ref.

**10578* Cytoplasmic Damage Caused by Gamma Radiation in *Allomyces Javanicus*.** Don Ritchie. *Botanical Gazette*, v. 115, Dec. 1953, p. 138-146.

Mycelia of aquatic phycomycete were exposed to $Co^{60}$. Effects of several doses on mitochondria are recorded. Micrographs. 18 ref.

**10579* Intake and Movement of Herbicides Injected Into Mesquite.** Byron O. Blair and George E. Glendening. *Botanical Gazette*, v. 115, Dec. 1953, p. 173-179.

Data on six chemicals injected into stems of velvet mesquite. Influence of relative humidity, soil moisture, and toxicity of solutions. Photographs, tables. 8 ref.

**10580* Comparative Effects of Catechol, Some Related Compounds, and Other Chemicals on Suberization of Cut Potato Tubers.** Austin O. Simonds, Gestur Johnson, and L. A. Schaal. *Botanical Gazette*, v. 115, Dec. 1953, p. 190-195.

Catechol, effective for stimulating wound-healing actions in Bliss Triumph tubers. Micrographs. 8 ref.

**10581* Growth-Controlling Effects of Some Quaternary Ammonium Compounds on Various Species of Plants.** Paul C. Marth, William H. Preston, Jr., and John W. Mitchell. *Botanical Gazette*, v. 115, Dec. 1953, p. 200-204.

Amo-1618 induced plants to develop relatively short internodes, thick stems, and dark green leaves. Maturity was delayed. Photograph, tables. 2 ref.

**10582* Experiments of the Insecticidal Control of the Tuber Flea Beetle, *Epitrix Tuberis* Gent., in the Interior of British Columbia.** D. G. Finlayson and C. L. Neilson. *Canadian Journal of Agricultural Science*, v. 34, Mar.-Apr. 1954, p. 156-160.

DDT, chlordane, toxaphene, parathion, and DDT-cryolite were applied to potato foliage at various rates and concentrations. First three gave effective commercial control. Tables, graph. 3 ref.

**10583* Changes in Organic Matter and Certain Other Soil Constituents in Forty Years of Cropping Under Irrigation.** R. F. Bishop and H. J. Atkinson. *Canadian Journal of Agricultural Science*, v. 34, Mar.-Apr. 1954, p. 177-180.

Soil became more alkaline; no significant changes occurred in respect to P and K status of the soil; total N and organic matter content increased. Tables. 10 ref.

**10584 Estimation of Pentose Nucleic Acid and Desoxypentose Nucleic Acid in the Liver and Brain Tissue of Mice Following the Feeding of the Insecticide Aldrin (Hexachlorohexahydrodimethanonaphthalene).** E. Annau. *Canadian Journal of Biochemistry and Physiology*, v. 32, May 1954, p. 178-183.

Includes tables. 17 ref.

**10585 Anticholinesterases. The Metabolic Conversion of Certain Organic Phosphorus Compounds Into Anticholinesterases.** B. A. Kilby. *Chemistry & Industry*, 1954, no. 19, May 8, p. 524-528.

Results from Schradan and other poisons. Tables. 20 ref.

**10586*** (Influence of Nitrogenous Fertilizers at Topsoil and Subsoil Levels of Turf-Podzol Soils.) **Deistvie azotnykh udobrenii na pakhotnyi i podpakhotnye gorizonty dernovo-podzolistykh pochv.** P. N. Koshel'kov and K. E. Tanin. *Doklady Akademii Nauk SSSR*, v. 94, no. 3, Jan. 21, 1954, p. 527-530.

Neutralization by application of 7 to 8 metric tons of $CaCO_3$ per hectare permits applications of ammonia forms of nitrogenous fertilizer; results in larger yields. Tables. 5 ref.

**10587* Application of Method of Tagged Atoms to the Study of Stability of Phosphor-Organic Insecticide Dusts.** (Russian.) K. A. Gar, N. N. Mel'nikov, Ia. A. Mandel'baum, V. I. Chernetsova, and K. D. Shvetsova-Shilovskaia. *Doklady Akademii Nauk SSSR*, v. 94, no. 4, Feb. 1, 1954, p. 729-732.

Toxic action under field conditions. Table, graphs. 2 ref.

**10588*** (Application of Tagged-Atom Method to Study of Resistance of Chinch Bug to Two Phosphor-Organic Insecticides and Investigation of Their Penetration in Plants.) **Primenenie**

**metoda mechenykh atomov k izucheniiu ustoichivosti klopa-cherepashki k dvym fosfororganicheskim insektitsidam i opyt izucheniia proniknoveniia ikh v rasteniia.** K. A. Gar, Ia. A. Mandel'baum, N. N. Mel'nikov, K. D. Shvetsova-Shilovskaia, and V. I. Chernetsova. *Doklady Akademii Nauk SSSR*, v. 94, no. 6, Feb. 21, 1954, p. 1189-1192.

Investigates diethyl-4-nitrophenyl phosphate and ethyl-4, 4'dinitrodiphenyl thiophosphate. Tables, graphs. 5 ref.

**10589* Influence of Calcium-Carbonate on Microbiological Processes in Solonets-Osolod Soils.** (Russian.) I. A. Mazilkin. *Doklady Akademii Nauk SSSR*, v. 95, no. 2, Mar. 11, 1954, p. 341-344.

Increases soil productivity. Tables. 8 ref.

**10590*** (Application of Radio-Chromatography to the Study of Sorption Dynamics, Motion, and Distribution of Phosphate Ions in Soils.) **Primenenie radiokhromatograficheskogo metoda k izucheniiu dinamiki sorbtsii, dvizheniia i raspredeleniia fosfat-ionov v pochvakh.** V. V. Rachinskii. *Doklady Akademii Nauk SSSR*, v. 95, no. 4, Apr. 1, 1954, p. 849-851.

Experiments using $P^{32}$ on red and podzol soils. Graphs. 9 ref.

**10591*** (Participation of Microorganisms of the Rhizosphere in the Vitamin Nutrition of Plants.) **Uchastie mikroorganizmov rizosfery v snabzhenii rastenii vitaminami.** G. M. Shavlovskii. *Doklady Akademii Nauk SSSR*, v. 95, no. 5, Apr. 11, 1954, p. 1101-1104.

$S^{35}$ tagged-atom method on three-week growth of buckwheat showed nicotinic acid and biotin in rhizosphere. Tables. 12 ref.

**10592*** (Influence of Leaf Feeding of Phosphorus on the Content of Nitrogenous Substances, Sugars, and Phosphoric Acid in Plants.) **Vliianie vnekornevogo pitaniia fosforom na soderzhanie v rasteniiakh azotistykh veschestv, sakharov i fosfornoi kisloty.** A. N. Lapshina. *Doklady Akademii Nauk SSSR*, v. 95, no. 5, Apr. 11, 1954, p. 1109-1111.

Application of P on oat leaves improved intake and utilization of nitrogenous materials. Photographs, tables. 4 ref.

**10593* Making Guesstimates on Insect Losses.** George C. Decker. *Farm Chemicals*, v. 117, May 1954, p. 44-46, 55.

Includes tables.

**10594* Are Spray Chemicals Too Hot to Handle?** Grant Cannon. *Farm Quarterly*, v. 9, Summer 1954, p. 45-47, 90-94.

Precautions in use of insecticides. Study of residues accumulating on vegetables, fruits, and animals. Photographs.

**10595* Flavor and Color Evaluation of Canning Crops Grown on Soil Treated With Insecticides.** J. C. Hening, A. C. Davis, and W. B. Robinson. *Food Technology*, v. 8, May 1954, p. 227-229.

After one year's tests on harvest from test plots, no off-flavor could be definitely ascribed to an insecticide but slight color changes were related to soil treatments. Tables. 4 ref.

**10596 Light—Its Influence on Plant and Animal Growth.** J. P. Ditchman. *General Electric Review*, v. 57, May 1954, p. 42-46.

Photo-periodic response to growth and production. Photographs, table.

**10597* Studies of Microörganisms Pathogenic to the Sod Webworm.** (English.) Irvin M. Hall. *Hilgardia*, v. 22, Feb. 1954, p. 535-565.

A spore-forming bacterium, two strains of a fungus, and a microsporidian were tested. *Bacillus thuringiensis* Berliner was fastest-acting and almost 100% effective. Graphs, photographs, tables. 51 ref.

**10598* Temperature Relations of Powdery Mildews.** (English.) C. E. Yarwood, Soliman Sidky, Morris Cohen, and Vincent Santilli. *Hilgardia*, v. 22, Mar. 1954, p. 603-622.

Criteria of fungus activity are number of conidia per conidiophore, rate of maturation of conidia, percentage germination of conidia, length of germ tubes *in vitro*, disease development, and length of hyphae *in vivo*. Graphs, tables. 42 ref.

**10599* Studies on Some Aspects of Bioassay of Stomach Poisons.** S. Pradhan and M. G. Jotwani. *Indian Academy of Sciences, Proceedings*, v. 39, sec. B, Feb. 1954, p. 37-43.

Starvation and susceptibility, body weight of larva, and susceptibility and effects of several smaller doses vs. one large dose were compared for DDT. Tables. 6 ref.

**10600* Problem of Calculation of Soil Temperature.** (Russian.) L. N. Gutman. *Izvestiia Akademii Nauk SSSR, Seriia Geofizicheskaia*, 1954, no. 2, p. 114-122.

Formulas for average daily temperature. Graph, tables. 18 ref.

**10601* Mineralogy and Classification of Phosphorites in Connection With Their Application in Agriculture.** (Russian.) G. I. Bushinskii. *Izvestiia Akademii Nauk SSSR, Seriia Geologicheskaia*, 1954, no. 1, Jan.-Feb., p. 3-12.

Geology, composition, and properties. Tables. 19 ref.

**10602* Toxicity Studies of Pesticides and Their Formulations.** L. W. Hazleton. *Journal of Agricultural and Food Chemistry*, v. 2, Apr. 28, 1954, p. 452-454.

Organization and execution of sound toxicity evaluation program. Application of industrial hygiene practice in manufacture and formulation. Diagram. 8 ref.

**10603* Plant Nutrients From Slag. Furnace Slag as a Source of Plant Nutrients and Its Liming Effectiveness Relative to Limestone.** P. P. Chichilo, W. H. Armiger, A. W. Specht, and C. W. Whittaker. *Journal of Agricultural and Food Chemistry*, v. 2, Apr. 28, 1954, p. 458-462.

Study of absorption by crops of some elements contained in blast furnace slag used for soil liming or supplied by soil or added fertilizer. Tables. 12 ref.

**10604* Soil Conditioner, Chemical Effects of a Soil Conditioner Upon Plant Composition and Uptake.** W. H. MacIntire, S. H. Winterberg, A. J. Sterges, and L. B. Clements. *Journal of Agricultural and Food Chemistry*, v. 2, Apr. 28, 1954, p. 463-468.

Effects of a Na polymer determined through 760 analyses of greenhouse crops. Tables. 17 ref.

**10605* Nitrogen Fixation by Excised Soy Bean Root Nodules.** M. H. Aprison, Wayne E. Magee, and R. H. Burris. *Journal of Biological Chemistry*, v. 208, May 1954, p. 29-39.

Consistent evidence of fixation obtained by rapid exposure of field-grown nodules to $N^{15}$ and analysis of their acid-soluble portion. Tables, graphs. 15 ref.

**10606* Studies on the Use of Permanent Milk Pipelines in Dairy Barns. III. Labor (Time) Requirements for Operation of Pipeline and Conventional Installations in a Stanchion Barn.** W. O. Nelson, E. E. Ormiston, and M. H. Alexander. *Journal of Dairy Science*, v. 37, May 1954, p. 583-589.

Relative labor requirements for a 24-cow barn. Tables. 6 ref.

**10607 Field Tests With Tick Repellents—1949, 1950, and 1952.** Carroll N. Smith, M. M. Cole, I. H. Gilbert, and H. K. Gouck. *Journal of Economic Entomology*, v. 47, Feb. 1954, p. 13-19.

Methods and materials; tests with individual compounds; effectiveness of various formulations and methods of application. Tables. 4 ref.

**10608 The Synergistic Action of Sulfoxide in Insecticide Sprays and Aerosols.** J. H. Fales, O. F. Bodenstein, and R. H. Nelson. *Journal of Economic Entomology*, v. 47, Feb. 1954, p. 27-29.

Experiments and results. Tables. 7 ref.

**10609 Effect of Curly Top-Infective Beet Leafhoppers on Cantaloup Plants in Varying Stages of Development.** Orin A. Hills and Edgar A. Taylor. *Journal of Economic Entomology*, v. 47, Feb. 1954, p. 44-48.

Effect of artificial infestation of cantaloupe, in various stages of development, with *Circulifer tenellus*. Graphs, tables. 3 ref.

**10610 Metabolism of Schradan by Plants and Insects to a Toxic Phosphoramide Oxide.** J. E. Casida, R. K. Chapman,

## *Agriculture*

M. A. Stahmann, and T. C. Allen. *Journal of Economic Entomology*, v. 47, Feb. 1954, p. 64-71.
Includes graphs, tables. 32 ref.

**10611 Response of the Pink Bollworm Moth to Certain Ultraviolet and Visible Radiation.** Perry A. Glick and Joe P. Hollingsworth. *Journal of Economic Entomology*, v. 47, Feb. 1954, p. 81-86.
Reviews previous investigations. Photographs, tables, graph. 13 ref.

**10612 Resistance to Insecticides as a Factor Influencing the Biotic Potential of the House Fly.** Massoud Varzandeh, W. N. Bruce, and George C. Decker. *Journal of Economic Entomology*, v. 47, Feb. 1954, p. 129-134.
Includes photographs, table. 9 ref.

**10613 Peristence of Chlordane in Soils of the Area Infested by the Japanese Beetle.** Walter E. Fleming and Warren W. Maines. *Journal of Economic Entomology*, v. 47, Feb. 1954, p. 165-169.
Includes tables. 5 ref.

**10614* A Comparison of the Effects of 3-Indolylacetic Acid and 3-Indolylacetonitrile on the Development of Sporelings of *Marsilea* in Aseptic Culture.** A. Allsopp. *Journal of Experimental Botany*, v. 5, Feb. 1954, p. 16-23.
Effects of nitrile on water fern growth. Diagrams, table, photographs. 8 ref.

**10615* Absorption of Nitrogen, Phosphorus, and Potassium From Nutrient Sprays by Leaves.** G. N. Thorne. *Journal of Experimental Botany*, v. 5, Feb. 1954, p. 37-48.
Barley, Brussels sprout, French bean, tomato, and sugar-beet plants grown in soil in pots and sprayed daily for several weeks, had higher nutrient contents and dry weights than control plants. Tables, graphs. 15 ref.

**10616* Studies With Radioactive Tracers in Plant Nutrition. III. The Effect of Radiation From Phosphorus-32 on the Growth and Phosphate Utilization of Barley Seedlings.** R. P. Martin and R. Scott Russell. *Journal of Experimental Botany*, v. 5, Feb. 1954, p. 91-109.
Extent to which effects of radiation may complicate interpretation of results of plant physiological investigatons. Tables, graphs. 22 ref.

**10617* Metal Interrelationships in Plant Nutrition. II. The Relation of Metal Toxicity, Molybdenum and Nitrogen Source to Chlorophyll and Magnesium Content of Beet in Sand Culture.** E. J. Hewitt. *Journal of Experimental Botany*, v. 5, Feb. 1954, p. 110-118.
Sugar and spinach beets were grown in sand with sources of N or Fe and different levels of Mo and heavy metals. Chlorophyll and some Mg fractions were determined. Tables. 15 ref.

**10618* Fifty Years of Chestnut Blight in America.** R. Kent Beattie and Jesse D. Diller. *Journal of Forestry*, v. 52, May 1954, p. 323-329.
Historical review. Control attempts. Photographs. 22 ref.

**10619* Seasonal Variations in Bark-Peeling Characteristics of Some Adirondack Pulpwood Species.** Hugh Wilcox, Felix Czabator, and Guido Girolami. *Journal of Forestry*, v. 52, May 1954, p. 338-342.
Tool to measure adherence of bark to wood and results of bark-peeling tests. Graphs, photographs, table. 6 ref.

**10620 Insect Repellents. I. Esters of Mandelic and Substituted Mandelic Acids.** W. F. Barthel, Jose Leon, and S. A. Hall. **II. Esters of 1-Hydroxycyclohexanecarboxylic Acid.** Jose Leon, W. F. Barthel, and S. A. Hall. **III. N,N-Diethylamides.** E. T. McCabe, W. F. Barthel, S. I. Gertler, and S. A. Hall. *Journal of Organic Chemistry*, v. 19, Apr. 1954, p. 485-498.
Maximum effect with simple alkyl esters of mandelic acid containing six or less C atoms. Tables. 7 ref.

**10621 Soil Fumigation. I. Sorption of Ethylene Dibromide by Soils.** Peter Wade. *Journal of the Science of Food and Agriculture*, v. 5, Apr. 1954, p. 184-192.
Sorption is rapid. Greater part of total amount sorbed is taken up within 30 min. Equilibrium established by end of 24 hrs. Tables, diagrams, graphs. 23 ref.

**10622* The Development of Knowledge on Plant Viruses and Virus Diseases.** F. C. Bawden. *Journal of Scientific & Industrial Research*, v. 13, sec. A, Mar. 1954, p. 106-113.
A review.

**10623* Some Alkyl Esters of *p*-Chloro-Benzene Sulfonic Acid With Insecticide Effect.** (Hungarian.) Károly Szabó and Elek Oswald. *Magyar Kémiai Folyóirat*, v. 60, no. 4, Apr. 1954, p. 99-101.
The $\beta$-ethyl hologen and $\beta$-ethyl thiocyano esters were found to be selectively active against mites, with low toxicity for warm-blooded animals. Table. 14 ref.

**10624* Microflora in the Rhizosphere of the Kok-Sagyz Plant.** (Russian.) E. A. Voroshilova. *Mikrobiologiia*, v. 23, no. 1, Jan.-Feb. 1954, p. 43-45.
Root system stimulates growth of $NH_3$ forming and denitrifying bacteria. Table. 5 ref.

**10625*** (Principal Forms of Rhizospheric Bacteria of Timothy *(Phleum Pratense)* and Change of Cell Numbers in the Rhizosphere According to Growth Stages and Age.) **Osnovnye formy rizosfernykh bakterii timofeevki (Phleum Pratense) i izmenenie kolichestva ikh kletok v rizosfere po fazam razvitiia i godam zhizni etogo rasteniia.** M. V. Fedorov and V. F. Nepomiluev. *Mikrobiologiia*, v. 23, no. 2, Mar.-Apr. 1954, p. 166-171.
Fluorescent, denitrifying, and mycobacter types. Tables. 6 ref.

**10626*** (Parasitic and Phytosymbiotrophic Properties of Varieties of the Species *Fusarium Lk.*) **O Parazitarnykh i fitosimbiotrofnykh svoistvakh vidov poda Fusarium Lk.** V. I. Bilai. *Mikrobiologiia*, v. 23, no. 2, Mar.-Apr. 1954, p. 178-184.
Antagonistic and beneficial behavior to various crops. Tables. 16 ref.

**10627 Relation of Polyphenol Oxidases to Fungitoxicity.** Saul Rich and James G. Horsfall. *National Academy of Sciences of the United States of America, Proceedings*, v. 40, Mar. 1954, p. 139-145.
Polyphenol oxidases of *S. sarcinaeforme* and *M. fructicola* detroxify certain phenols and quinones. *M. fructicola* appears to be more susceptible to these compounds. Table. 13 ref.

**10628 Application of a Systemic Insecticide by Trunk Implantation to Control a Mealybug Vector of the Cacao Swollen Shoot Virus.** A. D. Hanna and J. Nicol. *Nature*, v. 173, Apr. 17, 1954, p. 730-731.
Includes tables. 2 ref.

**10629* Boron Deficiency and Uptake of Boron in the Hop Plant.** H. O. Askew and R. J. Monk. *New Zealand Journal of Science and Technology*, v. 35, no. 4, Dec. 1953, p. 279-300.
Effect of B on failure of normal growth of hops and distortion of leaves. Photographs, tables. 11 ref.

**10630* Effectiveness of Cobalt Sulphate Applied to Cobalt-Deficient Pumice Land From the Air.** E. D. Andrews. *New Zealand Journal of Science and Technology*, v. 35, no. 4, Dec. 1953, p. 301-310.
Land aerially top-dressed with a solution at a rate of 20 oz. of hydrated salt per acre remained healthy for approximately 3 years. Tables, graph. 24 ref.

**10631* Toxicity of Micronutrients Toward Corn Leaf Catalase.** H. C. Eyster. *Ohio Journal of Science*, v. 54, May 1954, p. 145-148.
Cu and Zn were only toxic agents. Tables, graph. 4 ref.

**10632* Moldy Rot of the Hevea Rubbertree in Costa Rica.** J. B. Carpenter. *Plant Disease Reporter*, v. 38, May 1954, p. 334-337.

First seen in 1949; caused by *Ceratostomella* sp., and carried by a drosophilid. Inoculation and control.

**10633* Botrytis Diseases of Gladiolus.** Charles J. Gould. *Plant Disease Reporter*, v. 38, *Supplement* 224, May 1954, p. 3-33.

Development dependent upon cool temperatures and high humidity. Basic control measures are listed. Photographs, tables. 82 ref.

**10634* Hevea Diseases of the Western Hemisphere.** M. H. Langford, J. B. Carpenter, W. E. Manis, A. M. Gorenz, and E. P. Imle. *Plant Disease Reporter*, v. 38, *Supplement* 225, May 1954, p. 37-41.

Diseases affecting rubber and other trees in American tropics. Extent of control.

**10635* Control of South American Leaf Blight of Hevea Rubbertrees.** M. H. Langford and C. H. T. Townsend, Jr. *Plant Disease Reporter*, v. 38, *Supplement* 225, May 1954, p. 42-48.

Effective control achieved with insoluble Cu fungicides. Photographs.

**10636* Phytophthora Leaf Fall and Dieback.** W. E. Manis. *Plant Disease Reporter*, v. 38, *Supplement* 225, May 1954, p. 49-52.

Extent of development, diagnostic methods, and possible cures. Table.

**10637 Plant Food Prescription for Maximum Profit.** K. C. Berger. *Plant Food Journal*, v. 8, Jan.-Feb.-Mar. 1954, p. 4-5, 14.

Includes tables, photographs.

**10638* Peat Composts—Excellent Resources for Increasing Yields.** (Russian.) L. A. Gorshkov, A. A. Ziza, and K. N. Abalymov. *Sad i Ogorod*, 1954, no. 3, Mar., p. 28-33.

Experiments using mixtures of organic and mineral fertilizers. Table, photograph.

**10639*** (Application of DDT and Hexachlorane (Benzene Hexachloride) to Vegetable Culture.) **Primenenie preparatov DDT i geksakhlorana v ovoshchnom khoziaistve.** B. A. Gerasimov. *Sad i Ogorod*, 1954, no. 4, Apr., p. 24-27.

Control to protect beneficial insects and animals and preserve quality of products. Tables.

**10640*** (Control Measures for *Phytophthora Infestans.*) **O merakh bor'by s fitoftoroi.** O. P. Chernyshova. *Sad i Ogorod*, 1954, no. 4, Apr., p. 35-37.

Control measures include early setting of resistant varieties, cross cultivation, and spraying or dusting.

**10641 Insect Control and the Balance of Nature.** Ray F. Smith and William W. Allen. *Scientific American*, v. 190, June 1954, p. 38-42.

Alfalfa caterpillar provides good example of pest control with insecticides and by manipulation of ecological system. Diagrams, maps, photographs.

**10642*** (Significance of Isotopes and Other Advanced Methods of Investigation in Biology for Solving Agricultural Problems.) **Znachenie izotopov i drugikh noveishikh metodov issledovaniia v biologii dlia resheniia voprosov sel'skogo khoziaistva.** A. L. Kursanov. *Vestnik Akademii Nauk SSSR*, 1953, no. 12, Dec., p. 26-38 + 3 plates.

Investigations using tagged atoms of $C^{14}$, $N^{15}$, $I^{131}$, $P^{32}$, and $O^{18}$. Diagrams, photographs, table, radiogram.

**10643* New Concentrated Chlorine-Free Fertilizer.** (Russian.) A. Ia. Zvorykin. *Vestnik Akademii Nauk SSSR*, 1954, no. 3, Mar., p. 64-66.

Preparation and properties of K-$NH_3$ phosphate containing 50 to 52% $P_2O_5$, 16.5 to 20% $K_2O$, and 5.0 to 6.5% N.

**10644* Sewage Sludge as a Fertilizer.** A. H. Niles. *Water & Sewage Works (Reference and Data Edition)*, v. 101, May 1954, p. R228-R230.

Sludge has unique properties but is chemically inferior to commercial fertilizers. Table.

**10645*** (The Role of the Fauna in Forest Soils, Especially for the Decomposition of Leaves.) **Uber die Rolle der Tierwelt in Waldböden, besonders beim Abbau der Fallstreu.** Peter Volz. *Zeitschrift für Pflanzenernährung Düngung Bodenkunde*, v. 64, no. 3, 1954, p. 230-237.

Quantitative investigation method based on total wt. Three different soils were studied. Tables, graphs, photographs. 23 ref.

**10646*** (The Compost Humic Acids from Decomposition Residues of Organic Substances Important for Agriculture and Forestry.) **Uber Komposthuminsäuren aus Zersetzungsrückständen landwirtschaftlich und forstwirtschaftlich wichtiger organischer Stoffe.** U. Springer and A. Wagner. *Zeitschrift für Pflanzenernährung Düngung Bodenkunde*, v. 64, no. 3, 1954, p. 259-276.

Production and properties of humic acids from various organic decomposition residues. Comparison of gray and brown humic acids. Tables. 9 ref.

**10647*** (Change of Acidity of Granulated Superphosphate in Chernozem Soil.) **Izmenenie kislotnosti granulirovannogo superfosfata na chernozemnoi pochve.** O. A. Ostroumova. *Zemledelie*, v. 2, no. 1, Jan. 1954, p. 66-70.

Negative influence on germination of flax and mustard. Tables.

**10648*** (Influence of Boron on Yield and Quality of Winter Wheat.) **Vliianie bora na urozhai i kachestvo zerna iarovoi pshenitsy.** P. Kurguzov. *Zemledelie*, v. 2, no. 1, Jan. 1954, p. 71-72.

Stimulates azotobacteria; improves yield. Tables.

**10649*** (Aerosol Method of Insect Control in Greenhouses.) **Aerozol'nyi sposob dezinsektsii teplits.** G. K. Kal'bergenov. *Zemledelie*, v. 2, no. 1, Jan. 1954, p. 75-76.

Uses benzene hexachloride dissolved in kerosene and green oil. Table, photograph.

**10650*** (Production of Chemical Preparations for Rodent Control.) **Poluchenie khimicheskikh preparatov dlia bor'by s gryzunami.** M. Ia. Shliakman and E. S. Vasserman. *Zhurnal Prikladnoi Khimii*, v. 27, no. 4, Apr. 1954, p. 445-449.

Simplified synthesis of α-naphthylamine and phenyl thiourea from coal-tar wastes, fertilizer plants, and sewage. 2 ref.

***See also:***

**10662** (resistance of plants to infection)
**10781** (caking of fertilizers)
**10807** (risidual herbicide on food crops)
**10812** (analysis of insecticides)
**10817** (analysis of plant material)
**10839** (fungistatic activity of 3-hydroxy-biphenyl derivatives)
**10901** (physiological activity of carbamine esters)
**11163** (technology of commercial fertilizers)
**11440** (organic compounds as insecticides)
**11992** (freezing damage to cotton fibers)

## BIOCHEMICAL AND BIOPHYSICAL RESEARCH

**10651* Candidin, a New Antifungal Antibiotic Produced by *Streptomyces viridoflavus*.** Williard T. Taber, Leo C. Vining, and Selman A. Kaksman. *Antibiotics & Chemotherapy*, v. 4, Apr. 1954, p. 455-461.

Isolated a yellow, acidic antibiotic with marked *in vitro* activity against *Candida albicans, Blastomyces dermatitidis, Sporotrichum schenkii*, and various dermatophytes. Tables, diagram, graphs. 6 ref.

**10652* Actinomycin. I. Historical—Nature and Cytostatic Action.** Selman A. Waksman. *Antibiotics & Chemotherapy*, v. 4, May 1954, p. 502-510.

Isolation, activity, and chemistry. Tables. 37 ref.

## *Biochemical and Biophysical Research*

**10653* Plant Substances Active Against *Mycobacterium Tuberculosis.*** Florence K. Fitzpatrick. *Antibiotics & Chemotherapy,* v. 4, May 1954, p. 528-536.

Extracts from 300 vegetables, fruits, herbs, trees, and wild and cultivated plants were tested for inhibitory activity. Tables. 7 ref.

**10654* The Influence of Structure on the Hydrolysis of Substituted Phenyl β-d-glucosides by Emulsin.** R. L. Nath and H. N. Rydon. *Biochemical Journal,* v. 57, May 1954, p. 1-10.

Includes tables, graphs. 51 ref.

**10655* Transfer Reactions Catalysed by Some Sucrase Preparations.** J. Edelman. *Biochemical Journal,* v. 57, May 1954, p. 22-33.

Experiments with yeast- and mold-sucrase preparations, using radioactive sugars. Tables, chromatograms. 32 ref.

**10656* The Effect of Anionic Detergents and Some Related Compounds on Enzymes.** E. D. Wills. *Biochemical Journal,* v. 57, May 1954, p. 109-120.

Sodium sulfate, several aromatic sulfonic acids, and some commercial sulfonated detergents are compared. Graphs, tables. 28 ref.

**10657 The Anaerobic Dissimilation of *D-Glucose-1-C*$^{14}$, *D*-Arabinose-1-C$^{14}$, and *L*-Arabinose-1-C$^{14}$ by *Aerobacter Aerogenes.*** A. C. Neish and F. J. Simpson. *Canadian Journal of Biochemistry and Physiology,* v. 32, May 1954, p. 147-153.

Certain bacteria utilize a variety of sugars as energy sources. Mechanisms should aid understanding of basic problems in metabolism. Tables. 22 ref.

**10658 The Biosynthesis of Cell Wall Carbohydrates. Glucose-C$^{14}$ as a Cellulose Precursor in Wheat Plants.** Stewart A. Brown and A. C. Neish. *Canadian Journal of Biochemistry and Physiology,* v. 32, May 1954, p. 170-177.

Converts glucose to cellulose without skeletal rearrangement or appreciable cellulose formation from resynthesized glucose. Table. 18 ref.

**10659 The Determination of Serum Protein Fractions on Filter Paper Electropherograms by the Biuret Reaction, and Some Observations on the Serum Proteins of the Estrogenized Immature Pullet.** W. P. McKinley, W. A. Maw, W. F. Oliver, and R. H. Common. *Canadian Journal of Biochemistry and Physiology,* v. 32, May 1954, p. 189-199 + 1 plate.

Compares relative mobilities of serum protein fractions of domestic fowl and of man. Results of experiments with avian sera and egg yolk. Graphs, tables. 16 ref.

**10660 Nutrition of Animal Cells in Tissue Culture. VII. Use of Replicate Cell Cultures in the Evaluation of Synthetic Media. VIII. Desoxyribonucleic Acid Phosphorus as a Measure of Cell Multiplication in Replicate Cultures. IX. Synthetic Medium No. 703.** Raymond C. Parker, George M. Healy, and Dorothy C. Fisher. *Canadian Journal of Biochemistry and Physiology,* v. 32, May 1954, p. 306-337 + 1 plate.

Experimental procedures and results. Tables, graph, micrographs. 58 ref.

**10661* Restoration by Catalase of an Irradiated Lysogenic Bacterium. Production of Bacteriophage.** (French.) Branimir Miletic. *Comptes rendus,* v. 238, no. 14, Apr. 5, 1954, p. 1541-1542.

Restoration accomplished by increasing numbers of surviving cells and productive complexes. Observations after action of ultra-violet and X-rays. Tables.

**10662*** (Microbe-Antagonists and Antibiotic Substances as Factors of Plant Infection Resistance.) **Mikroby-antagonisty i antibioticheskie veshchestva kak faktory ustoichivosti rastenii k infestsiiam.** N. A. Krasil'nikov. *Doklady Akademii Nauk SSSR,* v. 94, no. 6, Feb. 21, 1954, p. 1177-1180.

Analysis of physical, chemical, and biological factors influencing immunity. Tables, micrograph. 6 ref.

**10663 Vitamin $B_{12}$ by Fermentation With *Streptomyces olivaceus.*** V. F. Pfeifer, C. Vojnovich, and E. N. Heger. *Industrial and Engineering Chemistry,* v. 46, May 1954, p. 845-849.

Materials, equipment, and procedures of pilot plant trials. Economic evaluation of process. Tables, graphs, diagrams. 20 ref.

**10664 Measurement of Oxygen Transfer.** Sam R. Hoover, Lenore Jasewicz, and Nandor Porges. *Instruments and Automation,* v. 27, May 1954, p. 774-775.

Use of magnetic analyzer in research and operation of sewage, industrial-waste, and fermentation plants. Graphs, diagrams, table. 6 ref.

**10665* The Study of Factors Which Influence Metabolic Reactivation of the Ultraviolet Inactivated Escherichia Coli.** F. Heinmets, J. J. Lehman, W. W. Taylor, and R. H. Kathan. *Journal of Bacteriology,* v. 67, May 1954, p. 511-522.

Suggests bacteria may be reactivated by incubation at 37 C with various metabolites. Graphs, tables. 14 ref.

**10666* Action of Chloramphenicol on T-1 Bacteriophage. I. Inhibition of Intracellular Multiplication.** F. M. Bozeman, C. L. Wisseman, Jr., H. E. Hopps ,and J. X. Danauskas. *Journal of Bacteriology,* v. 67, May 1954, p. 530-536.

Studies biochemical mechanisms involved in redirection of metabolic processes in infected cell toward virus production. Graphs, table. 12 ref.

**10667* The Isolation and Some Properties of an Antibiotic From Fusarium Bostrycoides.** F. A. Cajori, Theodore T. Otani, and Mary Alice Hamilton. *Journal of Biological Chemistry,* v. 208, May 1954, p. 107-114.

Isolation of growth-inhibiting pigment; chemical characteristics and properties. Graphs, spectrograms. 8 ref.

**10668 On the Surface Inactivation of Pepsin.** D. F. Chessman and H. Schuller. *Journal of Colloid Science,* v. 9, Apr. 1954, p. 113-121.

Films of pepsin studied in new method for isolation of unimolecular films of protein. Graphs, table. 11 ref.

**10669* Aspartate Dissimilation Reactions of Rumen Bacteria.** F. M. Sirotnak, R. N. Doetsch, Roslyn Q. Robinson, and J. C. Shaw. *Journal of Dairy Science,* v. 37, May 1954, p. 531-537.

Data obtained manometrically by inhibition experiments and by an analysis of end products. Principal pathway appears to be a deamination to succinate, decarboxylation to propionate, and further conversion to acetate and butyrate. Tables, graphs, diagram. 11 ref.

**10670* The Role of High Ionic Concentrations in Protection Against X-Irradiation.** C. S. Bachofer and M. Aelred Pottinger. *Journal of General Physiology,* v. 37, May 1954, p. 663-675.

Protection by addition of inorganic salts to aqueous virus suspensions during irradiation. Highest survival values are obtained with nitrite salts. Protective power is attributed primarily to function as reducing agents. Tables, graphs, diagram. 9 ref.

**10671* The Effect of Biotin on the Utilization of Glutamic Acid by Yeasts.** P. R. Krishnaswamy and K. V. Giri. *Journal of Scientific & Industrial Research,* v. 13, sec. A, Feb. 1954, p. 110-112.

BY2 yeast assimilates glutamic acid only in presence of biotin, whereas in *Rhodotorula* biotin enhanced rate of assimilation. Tables. 10 ref.

**10672* A Theory of Biosynthesis of Some Mould Products.** K. Aghoramurthy and T. R. Seshadri. *Journal of Scientific & Industrial Research,* v. 13, sec. A, Mar. 1954, p. 114-124.

Considers lichen compounds, benzene, toluquinone and anthraquinone derivatives, and dibenzofurans. Table. 78 ref.

**10673* Activity of Yeasts Which Are Adapted to Antiseptics.** (Russian.) A. A. Imshenetskii and K. Z. Perova. *Mikrobiologiia,* v. 23, no. 1, Jan.-Feb. 1954, p. 53-56.

Types adapted to $HgCl_2$ show greater fermentation activity than non-adapted types. Graphs.

**10674 The Effects of DNA and Enzyme-Treated DNA on Bacterial Population Changes.** Werner Braun and Jeanne Whallon. *National Academy of Sciences of the United States of America, Proceedings*, v. 40, Mar. 1954, p. 162-165.

Effects of desoxyribose nucleic acid in controlling biological activities. Graph, tables. 4 ref.

**10675 Nucleic Acid Precursors and Protein Synthesis.** Arthur B. Pardee. *National Academy of Sciences of the United States of America, Proceedings*, v. 40, May 1954, p. 263-270.

Abrupt removal of purine, pyrimidine, or phosphate components of nucleic acid, prevents enzyme induction in *E. coli* strains. Hypotheses regarding these observations were tested. Tables, graphs. 23 ref.

**10676 How Biological Effectiveness Varies With X-Ray Energy.** Walter S. Moos. *Nucleonics*, v. 12, May 1954, p. 46-49.

Dependence on X-ray wave length shown by irradiation of bacteria (4 to 2,000 kv) and results of other investigators. Tables, graphs. 41 ref.

**10677 Oxygen Poisoning and X-Irradiation: A Mechanism in Common.** Rebeca Gerschman, Daniel L. Gilbert, Sylvanus W. Nye, Peter Dwyer, and Wallace O. Fenn. *Science*, v. 119, May 7, 1954, p. 623-626.

Experiments on possibility that both form oxidizing free redicals. Tables, graph. 57 ref.

**10678 Some Aspects of the Chemistry and Biochemistry of Cholesterol.** Louis F. Fieser. *Science*, v. 119, May 21, 1954, p. 710-716.

46 ref.

**10679* The Chemistry of Cell Reproduction.** F. A. V. Butler. *Times Science Review*, 1954, Summer, p. 13-14.

Recent progress on nucleic acids and proteins. Micrographs, diagrams.

**10680* Newer Concepts of Tastes and Odors in Surface Water Supplies. II.** J. K. G. Silvey. *Water & Sewage Works*, v. 101, May 1954, p. 208-211.

Isolation and identification of noxious actinomycetes in raw-water and distribution systems. Photographs, micrographs. 2 ref.

*Books and Miscellaneous Publications*

**10681 Recent Progress in Hormone Research. v. IX. The Proceedings of the Laurentian Hormone Conference.** Gregory Pincus, editor. 467 p. 1954. Academic Press Inc., N. Y. (QP801.H7 R24)

Presents 20 papers on progesterone and metabolites; estrogens; neutral ketosteroids; non-ketonic neutral steroids; corticosteroids; and steroids as tracers. Includes summary.

***See also:***
**10756** (effects of lime softening on bacteria in water)
**10814** (estimation of serum proteins)
**10872** (photosynthesis outside cell walls)
**10887** (oxidation by bacteria)
**11325** (heat loss of lab animals)
**11867** (use of enzymes for range measurement of electrons)

## CERAMICS AND CONCRETE

**10682* The Devitrification Behaviour of Glasses Used in Vecuum Technics.** (English.) O. Knapp. *Acta Technica Academiae Scientiarum Hungaricae*, v. 8, nos. 1-2, 1954, p. 66-78.

Behavior of magnesia-glass for incandescent bulbs and Pb-glass for tube and rod drawing. Graphs, tables, micrographs, photograph. 4 ref.

**10683 Preparation of Reproducible Barium Titanate.** R. M. Callahan and J. F. Murray. *American Ceramic Society, Bulletin*, v. 33, May 1954, p. 131-133.

Complete, commercially practical fabrication process, using a carefully controlled dry-pressing procedure, results in a high-quality product with excellent reproducibility. Table.

**10684 Ceramics for Aircraft Propulsion Systems.** Lloyd D. Richardson, Sr. *American Ceramic Society, Bulletin*, v. 33, May 1954, p. 135-137.

History of research and development program.

**10685 A New Carbide-Base Cermet Containing TiC, $TiB_2$, and CoSi.** Harold M. Greenhouse, Robert F. Stoops, and Thomas S. Shevlin. *American Ceramic Society, Journal*, v. 37, May 1954, p. 203-206.

Development and properties. Has excellent load-carrying properties at 1800 F. Tables, graphs, micrographs. 5 ref.

**10686 Refractory Castables. II. Some Properties, and Effects of Heat-Treatments.** R. A. Heindl and Z. A. Post. *American Ceramic Society, Journal*, v. 37, May 1954, p. 206-216.

Differential thermal analyses and weight losses up to 1000 C for hydrated domestic and imported high-alumina hydraulic cements. Tables, graphs, micrographs. 9 ref.

**10687 Opacifying Crystalline Phases Present in Zirconium-Type Glazes.** C. W. F. Jacobs. *American Ceramic Society, Journal*, v. 37, May 1954, p. 216-220.

Glazes matured between cones 04 and 11 were studied by elevated temp. X-ray diffraction techniques. Tables, radiograms. 8 ref.

**10688 Improved Method of Measuring Thermal Conductivity of Dense Ceramics.** Edwin Ruh. *American Ceramic Society, Journal*, v. 37, May 1954, p. 224-229.

Requires specimen ½ in. in diameter by ½ in. long. Pressures of 1$\mu$ Hg used to insulate and permit rapid steady-state conditions. Photographs, diagram, tables, graphs. 3 ref.

**10689 Elastic Moduli of Glasses by a Dynamic Method.** Sam Spinner. *American Ceramic Society, Journal*, v. 37, May 1954, p. 229-234.

Elastic moduli and speed of sound of 23 optical glasses; $Na_2O$, $CaO$, $SiO_2$, and $B_2O_3$ glasses; and some fused silicas. Tables, diagrams, graphs. 10 ref.

**10690 Some Properties of the System $Na_2O$-NaF-$B_2O_3$-$H_2O$.** Burnham W. King. *American Ceramic Society, Journal*, v. 37, May 1954, p. 238-242.

Includes phase diagrams, table. 6 ref.

**10691* Design of Concrete Mixes for Vacuum Processing.** John G. Dempsey. *American Concrete Institute, Journal*, v. 25, Apr. 1954, p. 677-686; *ACI Proceedings*, v. 50, 1954, p. 677-686.

Application of vacuum process to field and laboratory mixes analyzed with respect to workability and strength. Apparent relationship between vacuum process slabs and specialized vacuum cylinders made from same batch. Tables.

**10692 Physics of the Glassy State. II. The Transformation Range. III. Strength of Glass. IV. Radiation-Sensitive Gasses.** E. U. Condon. *American Journal of Physics*, v. 22, Mar. 1954, p. 132-142; Apr. 1954, p. 224-232; May 1954, p. 310-317.

Activation energies and modern views of chemical rate processes in relation to kinetics of the approach to equilibrium. Effects of adsorbed moisture and acid treatments on strength. Solar radiation color changes and *F* centers. Tables, graphs, diagram. 59 ref.

**10693* Research on Sintering of Refractory Mortars.** (German.) H. W. Thoenes. *Berichte der deutschen keramischen Gesellschaft*, v. 31, no. 4, Apr. 1954, p. 103-110.

Physico-chemical processes of sintering, interface reactions, and diffusion. Nature of process and effect of temperature on porosity and structural strength. Photographs, graphs, tables. 21 ref.

**10694 Reproducibility in the Refractoriness-Under-Load Test.** A. H. B. Cross. *British Ceramic Society, Transactions*, v. 53, Feb. 1954, p. 77-94.

Tests should give similar results in several laboratories. Reproducibility in one laboratory was studied by means of three tests. Photographs, diagram, tables, graphs.

## *Ceramics and Concrete*

**10695 Some Aspects of the Testing of Clays for the Pottery Industry.** D. G. Beech and D. A. Holdridge. *British Ceramic Society, Transactions,* v. 53, Feb. 1954, p. 103-133.

Rapid chemical analysis, mineralogical assays, and physical tests for strength and particle size. Graphs, photograph, tables, radiograms. 17 ref.

**10696 A Co-operative Test on Thermal Conductivity.** A. F. Watson, J. F. Clements, and J. Vyse. *British Ceramic Society, Transactions,* v. 53, Feb. 1954, p. 156-164.

Test on diatomite insulating bricks were compared in four laboratories. Graphs. 7 ref.

**10697 Relative Translucencies of the System Bone-China Clay-Stone.** W. L. German and S. W. Ratcliffe. *British Ceramic Society, Transactions,* v. 53, Mar. 1954, p. 165-174; discs., p. 174-179.

Translucency increases with more fluxing material and finer grinding in simple apparatus. Graphs, tables, diagrams. 18 ref.

**10698 The Solubility of Lead Glazes. V. Chemical Factors Affecting Solubility Determinations.** H. Bennett. *British Ceramic Society, Transactions,* v. 53, Mar. 1954, p. 203-217.

Method involves precipitation of Pb as sulphide, followed by determination as chromate. Main cause of contamination is silica. Occasionally metals of Group III and Ba cause difficulty. Tables.

**10699 A Study of Alumina Suspensions. III. Effect of Ageing on Rheological and Casting-Behaviour.** P. Howard and A. L. Roberts. *British Ceramic Society, Transactions,* v. 53, Apr. 1954, p. 271-291.

Includes diagrams, graphs, tables. 9 ref.

**10700* Progress in Porous and Hollow Ceramics for Construction.** Felix Singer and Sonja S. Singer. *British Clayworker,* v. 63, May 1954, p. 55-59.

Properties and uses in thermal insulation and acoustics. Tables. 23 ref.

**10701*** (Committee of Engineers for the Utilization of Refractory Materials. Special Construction of Chromium-Magnesium Oxide Burners on a 70-Ton Maerz Furnace, Operating With Producer Gas.) **Commission d'ingénieurs pour l'utilisation des produits réfractaires. Construction spéciale de bruleurs en chrome-magnésie sur un four Maerz de 70 t fonctionnant au gas de gazogènes.** Savarre. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques,* v. 11, no. 4, 1954, p. 735-743.

Design, operation, and results. Diagrams, table, graphs.

**10702*** (Committee of Engineers for Utilization of Refractory Materials. Special Clays for Linings of Electric Furnaces for Steel Plants and Especially for High-Frequency Furnaces.) **Commission d'ingénieurs pour l'utilisation des produits réfractaires. Les pisés speciaux pour revetement des fours électriques d'aciérie, et en particulier les four haute fréquence.** Seloron. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques,* v. 11, no. 4, 1954, p. 745-752.

Analytical study of American, Australian, French, and Greek clays.

**10703 Strategic Synthesis.** *Chemical Week,* v. 74, May 22, 1954, p. 46 + 5 pages.

Synthetic mica can replace Indian imports at a moderately higher price. Process outlined. Photograph, diagram.

**10704* The Demands of the Carbonizing Industry on the Refractories and Allied Industries.** C. Edwards. *Claycraft,* v. 27, Apr. 1954, p. 352-356.

Defects and disadvantages of fire- and silica-bricks.

**10705* Purification of Refractory Substances by Treatment in Solar Furnace.** (French.) Félix Trombe and Marc Foex. *Comptes rendus,* v. 238, no. 13, Mar. 29, 1954, p. 1419-1420.

Results on $ThO_2$, $ZrO_2$, $Al_2O_3$, and $La_2O_3$. Diagrams. 4 ref.

**10706 Effect of Exposure to Soils on the Properties of Asbestos-Cement Pipe.** Melvin Romanoff and Irving A. Denison. *Corrosion,* v. 10, May 1954, p. 169-179.

Final results of study of two varieties of asbestos-cement pipe after exposure to wide variety of soil conditions for maximum of 13 yr. Tables, photographs, graphs. 10 ref.

**10707*** (Chemical Resistance of Glasses From Peat Slags.) **Khimicheskaia ustoichivost' stekol iz torfianykh shlakov.** M. A. Bezborodov and L. Ia. Mazelev. *Doklady Akademii Nauk SSSR,* v. 94, no. 3, Jan. 21, 1954, p. 531-534.

Satisfactory resistance to aqueous and alkaline solutions. Exposure to acids show many variations are thoroughly destroyed or suffer deep-seated corrosion. Acid solutions cause loss of initial vitreous state; changes in physical properties, color, refractive index, and adsorption ability. Tables. 5 ref.

**10708*** (Artificial Stabilization of Quartz Lattice.) **Iskusstvennaia stabilizatsiia reshetki kvartsa.** E. V. Tsinzerling. *Doklady Akademii Nauk SSSR,* v. 95, no. 3, Mar. 21, 1954, p. 529-530 + 1 plate.

Effect of d.c. field on plastic properties. Micrographs. 4 ref.

**10709* Ferroelectric Ceramics in Electrochemical Equipment.** (Russian.) D. M. Kazarnovskii. *Elektrichestvo,* 1954, no. 2, Feb., p. 40-51.

Properties and technical use. Tables, graphs, diagrams. 26 ref.

**10710* Refractory Siliceous Linings. Improvement and Control of Shrinking and Drying.** (French.) Paul Blanchard. *Fonderie,* 1954, Mar., no. 98, p. 3864-3869.

Composition and wear of refractory lining in a rotating furnace. Diagrams, graphs, photographs, table.

**10711* Silicone Can Improve Glass Performance.** *Glass Packer,* v. 33, May 1954, p. 25-27, 53.

Scratch resistant coatings for containers. Photographs.

**10712* Thermal Expansion of Muscovite Mica.** A. K. Sreedhar and R. S. Krishnan. *Indian Institute of Science, Journal,* v. 36, sec. A, Apr. 1954, p. 91-96.

Expansion parallel to cleavage plane investigated up to 400 C. using interferometric technique. Graph, table. 7 ref.

**10713 Modern Portland Cement Production.** William Q. Hull, Peter Hass, and Paul Franklin. *Industrial and Engineering Chemistry,* v. 46, May 1954, 830-842.

Historical development, composition, method of manufacture, economic considerations in production, and applications. Tables, photographs, diagrams. 20 ref.

**10714 Facts About Silicon Carbide. I.** *Industrial Heating,* v. 21, May 1954, p. 992 + 4 pages.

Discovery, development, manufacture, and final forms of existing products. Photographs. 17 ref. (To be continued.)

**10715 High Temperature Insulation.** G. E. Marsh. *Iron & Steel,* v. 27, May 1954, p. 165-168.

Properties and potentialities of refractory brick in range above 600 C. Diagrams.

**10716 Atypical pH Response of Some Nonsilicate Glasses.** Herman F. Shermer, Gerald F. Rynders, Given W. Cleek, and Donald Hubbard. *Journal of Research, National Bureau of Standards,* v. 52, May 1954, p. 251-258.

Following glasses were examined for pH response: $Na_2O$-MgO-$P_2O_5$; $Na_2O$-$GeO_2$; and BaO-$B_2O_3$. Electrical responses to pH activity were superficial. Graphs, tables. 15 ref.

**10717* The Manufacture of Magnesite Brick, Chemically Bonded With Sulfate.** (Hungarian.) Arisztid Cser. *Kohászati Lapok,* v. 9, no. 2, Feb. 1954, p. 69-71.

Effect of moisture and bonding material on hardness. Suitable for lining of steel furnaces. 3 ref.

**10718*** (Glass Fiber Reinforcements and Their Use in Plastics.) **Glasfaserverstarkungen und ihre Verwendung bei Kunststoffen.** A. R. Henning. *Kunststoffe,* v. 44, no. 4, Apr. 1954, p. 131-133.

Mechanism of reinforcing effect; manufacture reactions; influ-

ence of state of fiber surface; manufacture of glass yarn, felt, and mats. Tables, photographs.

**10719 High-Alumina Ceramics.** Daniel W. Luks. *Machine Design*, v. 26, May 1954, p. 133-136.

High heat and wear resistance; mechanical strength; and insulation characteristics. Graphs, photographs, tables.

**10720 Titanium Carbide.** John W. Graham. *Machine Design*, v. 26, May 1954, p. 159-162.

Endurance at high temperature outstanding property of cemented carbide. Examples of uses. Photograph, table, graph.

**10721 Mechanical Glass.** Robert L. Edwards. *Machine Design*, v. 26, May 1954, p. 170-174.

Thermal endurance; mechanical strength; corrosion and abrasion resistance; and dimensional stability. Photographs.

**10722 Graphite in Industry.** J. Lomas. *Machinery Lloyd (Overseas Ed.)*, v. 26, Apr. 24, 1954, p. 75-77.

Advantageous uses of colloidal, electrically-produced graphite include lubrication; parting powder in foundry molds; impregnation of metallic and other surfaces; and electronics.

**10723*** (Contribution to the Knowledge of the System CaO – $SiO_2$.) **Beitrag zur Kenntnis des Systems CaO + $SiO_2$. I-II.** Branko S. Brcic. *Monatshefte für Chemie*, v. 85, no. 2, Apr. 15, 1954, p. 318-326.

Effects of experimental conditions in formation of calcium silicates. Graphs, table. 24 ref.

**10724*** (The Structure and Properties of Synthetic Montmorillonites.) **Uber die Struktur und die Eigenschaften synthetischer Montmorillonite. I.** (The Exchangeability and Thermal Behavior of Synthetic Mg and Na Montmorillonites.) **Das Austauschvermögen und das thermische Verhalten von synthetischen Mg- und Na-Montmorilloniten.** M. Karsulin and Vl. Stubican. *Monatschefte für Chemie*, v. 85, no. 2, Apr. 15, 1954, p. 343-358.

Ion exchange, X-ray structure, thermal behavior, and amount of tetrahedrally coordinated Al. Graphs, tables, radiograms. 20 ref.

**10725* Masonry Protection.** Martin E. Schleicher. *Paint Industry Magazine*, v. 69, May 1954, p. 19, 24, 34.

Use of silicone water repellants. Diagrams.

**10726 Magnetic Susceptibility of Carbons and Polycrystalline Graphites. I.** H. T. Pinnick. *Physical Review*, v. 94, ser. 2, Apr. 15, 1954, p. 319-326.

Relation of susceptibility to a dimension of crystallites was studied over range from turbostratic carbons with diameters of 50 A. to graphitic crystals of several thousand A. Table, graphs, radiogram. 25 ref.

**10727* Lime-Bound Masonry Materials.** N. V. S. Knibbs. *Pit and Quarry*, v. 46, May 1954, p. 124-128.

Cement replaces lime in cases where curing by steam under pressure is used.

**10728* Bond Between Mortar and Concrete Masonry Units.** John C. Thornton. *Pit and Quarry*, v. 46, May 1954, p. 238-240.

Amount of bond between mortar and unit was inversely proportional to amount of capillarity of surface of unit. Wetting and other results are noted. Table, graphs.

**10729* Fireclays and the Silica Brick.** R. H. Warring. *Refractories Journal*, v. 30, Apr. 1954, p. 136-138.

Developments in products and manufacturing processes. Tables.

**10730* Properties and Potentialities of High Temperature Insulation.** G. E. Marsh. *Refractories Journal*, v. 30, Apr. 1954, p. 139-146.

Savings in fuel and time overcome initial cost of material. Diagrams.

**10731 Electrical Properties of Ceramics. I. Semi-Conductors.** J. Volger. *Research*, v. 7, May 1954, p. 196-203.

General discussion of crystallographic structure and electronic conductivity of some ceramic materials. Diagrams, tables, graphs. 27 ref.

**10732* Silica Cement. Strength and Heat of Hydration Properties.** T. Yoshii and K. Kaneko. *Rock Products*, v. 57, May 1954, p. 80, 82.

Includes tables, graphs.

**10733 The Strength Properties and Frictional Behaviour of Brittle Solids.** R. F. King and D. Tabor. *Royal Society, Proceedings*, v. 223, ser. A, Apr. 22, 1954, p. 225-238 + 4 plates.

Application of adhesional theory of friction to rock-salt, glass, and PbS. Tables, graphs, photographs, micrographs. 21 ref.

**10734*** (Computing the Expansion of Silicate Glasses, Glazes, and Enamels.) **Die Berechnung der Ausdehnung von silikatischen Gläsern, Glasuren und Emails.** A. A. Appen. *Silikat Technik*, v. 5, no. 3, Mar. 1954, p. 113-114.

Method agrees closely with actual expansion coefficients. Tables.

**10735*** (New Types of Cement.) **Neue Zementarten.** N. E. Israilowitsch. *Silikat Technik*, v. 5, no. 3, Mar. 1954, p. 126-130.

Compositions, properties, and specifications for hydrophobic, water-impermeable, and sulfate-resistant cements and concretes. Table.

**10736*** (Refractories for Kilns and Furnaces.) **Ausbaumaterial für Kachelöfen und Herde.** Alfred Pendt. *Silikat Technik*, v. 5, no. 3, Mar. 1954, p. 139-141.

Processing, molding, drying, and firing of rafractory clays. Testing fired ware for thermal expansion and refractory properties. Diagrams, graphs, table. 8 ref.

**10737*** (Rammed Lining for Cupola Furnace.) **Pechovani vystylky kuploven.** Josef Kuklinek. *Slévárenství*, v. 2, no. 2, Feb. 1954, p. 48-50.

Economy and chemical analysis. Diagram.

**10738*** (Adoption of Glazing to the Body in Ceramic Ware.) **Anpassung Glasur/Scherben bei Tongut.** Franz Kure. *Sprechsaal*, v. 87, no. 8, Apr. 22, 1954, p. 173-177.

Causes of hair-line cracks; composition specifications; availability of testing methods. Diagrams, graphs, tables. 31 ref.

**10739* Quantum Theory of Heat Capacity and the Structure of Silicate Glasses.** (Russian.) V. V. Tarasov. *Steklo i Keramika*, v. 11, no. 2, Feb. 1954, p. 6-9.

Application in detecting structural features. Graphs, diagrams. 11 ref.

**10740* Concept of Internal Structure of Silicate Glasses.** (Russian.) L. I. Demkina. *Steklo i Keramika*, v. 11, no. 2, Feb. 1954, p. 10-15.

Relationship of structure and properties. Graphs. 6 ref.

**10741* Technical System of Polishing Glass by Sands on the Tools 4 ShS.** (Russian.) A. S. Totesh. *Steklo i Keramika*, v. 11, no. 2, Feb. 1954, p. 21-23.

Successful substitution of sands for emery. Tables. 1 ref.

**10742* Contolling the Properties of Ceramic Bodies by Colloid-Chemical Means.** (Russian.) G. V. Kukolev and Ia. M. Syrkin. *Steklo i Keramika*, v. 11, no. 2, Feb. 1954, p. 23-29.

Effect of various additives on indices of plasticity and other properties of clay bodies. Tables, graphs. 9 ref.

**10743* Drying Periods for Ceramic Sewer Pipes.** (Russian.) R. M. Zaionts. *Steklo i Keramika*, v. 11, no. 2, Feb. 1954, p. 30-32.

Drying blasts; pipe shape and size; and moisture content. Diagrams, table, graphs.

**10744*** (Sensitivity of Clays to Drying.) **Chuvstvitel'nost glin k sushke.** A. F. Chizhskii. *Steklo i Keramika*, v. 11, no. 4, Apr. 1954, p. 11-15.

Relationship between safe drying rate and sensitivity coefficient. Graphs, tables. 4 ref.

**10745*** (Shaping the Edges of Sheet Glass in Floatless Vertical Drawing.) **Formovanie bortov lenty stekla pri bezlodochnom vertikal'nom vytiagivanii.** I. D. Tykachinskii

## *Ceramics and Concrete*

and I. O. Tomashevich. *Steklo i Keramika*, v. 11, no. 5, May 1954, p. 7-12.

Increased capacity by edge forming plates and rollers. Diagrams.

**10746*** (Preparation of an Extra-Fine Mat Finish.) **Polu-chenie shlifovkoi osobo tonkoi matovoi poverkhnosti.** A. S. Totesh and E. V. Gurkovskii. *Steklo i Keramika*, v. 11, no. 5, May 1954, p. 12-14.

Plastic materials used in place of corundum for polishing glass. Tables, graphs. 1 ref.

**10747*** (Temperature Resistance of Glass and Mineral Fiber.) **Temperaturoustoichivost' stekliannogo i mineral'-nogo volokna.** I. Z. Volchek. *Steklo i Keramika*, v. 11, no. 5, May 1954, p. 27-28.

Tests determine temperature of incipiant fusion of a fiber mat using a load of 20 g. per $cm.^2$. Tables. 3 ref.

**10748*** (Rapid-Setting Portland Cement.) **Spesialcementer.** Johs. Rutle. *Teknisk Ukeblad*, v. 101, no. 16, Apr. 22, 1954, p. 377-386.

Composition and properties. Graphs, diagrams.

**10749* Quartz Bricks and Blocks.** (German.) Alexander Frhr. v. Beaulieu Marconnay. *Werkstoffe und Korrosion*, v. 5, no. 4, Apr. 1954, p. 123-129.

Production and use in copper works, open-hearth furnace, chemical works, and specialized electric furnaces. Diagrams. 11 ref.

**10750* Temperature Dependence of Viscosity of Liquid and Molten Glasses.** (Russian.) V. T. Slavianskii. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 12, Dec. 1953, p. 1776-1783.

Graphic method permits representation in form of a straight line. Graphs. 8 ref.

**10751* The Influence of Viscosity on Rate of Crystallization of Silica Glasses.** (Russian.) M. V. Okhotin. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 2, Feb. 1954, p. 254-257.

Includes tables. 3 ref.

**10752* Interaction of Lead Titanate With Salts in Fusion.** (Russian.) I. N. Beliaev, M. L. Sholokhovich, and G. V. Barkova. *Zhurnal Obshchei Khimii*, v. 24, no. 2, Feb. 1954, p. 211-215.

Fusibility diagrams with fluorides, pyrophosphates, molybdates, tungstates, and carbonates of Na and K at 1100 C. Graphs, tables. 7 ref.

**10753* Interaction of Barium Titanate With Salts in Fusions.** (Russian.) M. L. Sholokhovich and I. N. Beliaev. *Zhurnal Obshchei Khimii*, v. 24, no. 2, Feb. 1954, p. 218-224.

Fusibility diagrams with fluorides, silicates, carbonates, pyro- and meta-phosphates, meta-borates, chlorides, molybdates, sulfates, and tungstates of alkaline and bivalent metals. Tables. 13 ref.

**10754*** (Isotherms of the Quaternary System MgO-CaO--$P_2O_5$-$H_2O$ at 50, 25, 58, 10 and 130 C.) **Izotermy pri 50, 25, 58, 10, i 130° chetvernoi sistemy MgO-CaO-$P_2O_5$-$H_2O$.** A. P. Belopol'skii, S. Ia. Shpunt, and M. N. Shul'gina. *Zhurnal Prikladnoi Khimii*, v. 27, no. 4, Apr. 1954, p. 391-401.

Composition of solutions corresponding to points on curves fixing limits of crystallization at various temperatures. Tables, graphs. 3 ref.

***See also:***
**11042** (dielectric strength of ceramic insulators)
**11445** (ceramics for high temperatures service—book)
**11977** (fiberglass textiles)

## CHEMICAL ENGINEERING

**10755* Mechanism and Control of Scale Formation in Sea Water Distillation.** W. F. Langelier. *American Water Works Association, Journal*, v. 46, May 1954, p. 461-469.

Theory of mechanism of scale formation in water distillation equipment, based upon principles of nucleation from supersaturated solutions. Graphs, diagram. 5 ref.

**10756* Effects of Lime Softening.** Merrill L. Riehl, Herbert O. Hartung, and Frank S. Taylor. *American Water Works Association, Journal*, v. 46, May 1954, p. 493-498.

Effects on bacteriological quality of water. Graphs. 10 ref.

**10757* The Design of Chemical Experiments.** D. R. Read. *Biometrics*, v. 10, Mar. 1954, p. 1-15.

Non-mathematical approach and statistical problems associated with formulation of development procedures. Tables, diagram. 2 ref.

**10758 Mixing—The Universal Operation. I. Mixing. II. Liquid Mixing. III. Paste Mixing. IV. Plastics Mixing. V. Solids Mixing. VI. Continuous.** Charles S. Quillen. *Chemical Engineering*, v. 61, June 1954, p. 177-224.

Various methods and machinery used in industry. Photographs, graphs, diagrams, tables.

**10759 Where Maintenance Is Really Tough.** *Chemical Engineering*, v. 61, June 1954, p. 230-233.

Taken from papers by O. C. Schroeder and K. K. Campbell presented at 1953 Conference on Nuclear Engineering, Univ. of Calif., Berkley. Process equipment for nuclear chemicals requires mechanical simplicity, standardization, leakage control, and no valves. Plan for maintenance-by-replacement. Photographs.

**10760 Sorption in Gas and Air Drying.** Frank M. Waterhouse. *Chemical Engineering*, v. 61, June 1954, p. 237-242.

Economic study and comparison will tell whether cooling-condensation or sorption is best. Tables, diagrams, photographs.

**10761 Heavy Water.** Patrick J. Selak and Joseph Finke. *Chemical Engineering Progress*, v. 50, May 1954, p. 221-229.

Reviews large scale production processes and plants. Diagrams, tables, photographs, graph. 11 ref.

**10762* The Additivity of Resistances in Mass Transfer Between Phases.** T. H. Goodgame and T. K. Sherwood. *Chemical Engineering Science*, v. 3, Apr. 1954, p. 37-42.

Additivity is confirmed by experimental measurements of transfer coefficients for vaporization of water into air, and absorption from air of $CO_2$, $NH_3$, and acetone by water. Graph, tables, diagram. 13 ref.

**10763* Hydroextraction. VIII. Cake Formation.** M. M. Haruni and J. Anderson Storrow. *Chemical Engineering Science*, v. 3, Apr. 1954, p. 43-47.

Mechanism may be altered by different methods of feeding slurry to the basket. Examples of growth parallel to basket wall rather than normal, leading to formation of wedge-shaped cakes. Table, graphs. 5 ref.

**10764* Liquid-Liquid Extraction in a "Rotating Disc Contactor".** H. J. A. Vermijs and H. Kramers. *Chemical Engineering Science*, v. 3, Apr. 1954, p. 55-64.

Extraction performance of contactor of small diameter for various rotor speeds, total throughput, and solvent to feed ratios. Diagram, tables, graphs. 11 ref.

**10765* The Sedimentation of a Suspension of Uniform Spheres Under Conditions of Viscous Flow.** J. F. Richardson and W. N. Zaki. *Chemical Engineering Science*, v. 3, Apr. 1954, p. 65-78.

Dynamic equilibrium of a suspension settling in a fluid and expression for drag force on a constituent particle. Graphs, tables. 6 ref.

**10766* Chemical Engineering Review: Filtration.** E. L. Streatfield. *Chemical & Process Engineering*, v. 35, May 1954, p. 143-146.

Fundamentals; equipment; filter aids and media; and applications. Photographs. 84 ref.

**10767* The Sasol Oil-From-Coal Works.** *Chemical & Process Engineering*, v. 35; *Corrosion Technology*, v. 1, May 1954, p. 153-155.

New South African Project for fuels and chemicals. Tables.

**10768* Synthesis of 1,1-Diphenylpropane Hydroperoxide.** (Russian.) D. K. Tolopko and T. I. Iurzhenko. *Doklady Akademii Nauk SSSR*, v. 94, no. 4, Feb. 1, 1954, p. 707-708.

Physical and chemical constants. Graph. 3 ref.

**10769* Catalytic Transformations of *n*-Heptone and *n*-Octane in Presence of Platinized Carbon.** (Russian.) B. A. Kazanskii, A. L. Liberman, T. F. Bulanova, V. T. Aleksanian, and Kh. E. Sterin. *Doklady Akademii Nauk SSSR*, v. 95, no. 1, Mar. 1954, p. 77-80 + 1 plate.

Includes tables, spectrograph, micrographs.

**10770* Chemical Progress.** *Forbes*, v. 73, May 15, 1954, p. 19 + 17 pages.

Advances made in chemical industry in fields of petrochemicals, heavy chemicals, sulfur, plastics, agriculture, and coal chemicals. Photographs, graphs, tables.

**10771 Electrostatic Effects in Fiber Filters for Aerosols.** A. T. Rossano, Jr. and Leslie Silverman. *Heating and Ventilating*, v. 51, May 1954, p. 102-108.

Fibrous filters in which aerosol removal is accomplished by electrostatic forces occurring naturally within the fibrous mass. Graphs, diagrams, photographs, table. 8 ref.

**10772 Activation of Carbons.** W. K. Lewis and A. B. Metzner. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 849-858.

Raw materials, procedures, and mechanism of process. Properties of finished product. Graphs, tables. 33 ref.

**10773 Sulfuric Acid Regeneration of High Capacity Exchanger.** John H. Kay, J. I. Bregman, A. M. Fradkin, and J. S. D'Amico. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 862-866.

Advantages, limitations, and suggested procedures for regeneration processes employing relatively high acid concentrations. Tables, graphs. 9 ref.

**10774 Plant Purification of Synthesis Gas.** L. P. Wenzell, Jr., R. G. Dressler, and H. R. Batchelder. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 858-862.

Equipment, plant layout, and operating procedures. Diagrams, tables. 6 ref.

**10775 Descaling of Evaporator Heating Surfaces in Cane Sugar Factories.** N. O. Schmidt and L. F. Wiggins. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 867-870.

Experiments on prevention and removal of scale. Tables, photograph. 3 ref.

**10776 Material Transfer in Turbulent Gas Streams.** N. T. Hsu, K. Sato, and B. H. Sage. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 870-876.

Investigates influence of drop shape on evaporation of *n*-heptane. Tables, graphs, diagram. 40 ref.

**10777 Symposium on Chemical Engineering Fundamentals Review.** *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 880-952.

Includes "Chemical Rate Processes"; "Rate Theory and Homogeneous Reactions", R. H. Wilhelm; "Heterogeneous Catalysis", M. Boudart; "Molecular Transport Properties of Fluid", E. F. Johnson; and "Diffusion and Oxidation of Solid Metals", C. E. Birchenall; "Colloidal and Surface Phenomena", Geoffrey Broughton; "Computers, Statistics and Mathematics", Arthur Rose, Richard L. Heiny, R. Curtis Johnson, and Joan A. Schilk; "Fluid Dynamics", A. K. Oppenheim and Thomas Baron; "Heat Transfer", E. R. G. Eckert; "Mass Transfer", Robert L. Pigford; and "Thermodynamics", J. M. Smith. 1726 ref.

**10778 Cation Exchange Materials From Cotton and Polyvinyl Phosphate.** George C. Daul, J. David Reid, and Robert M. Reinhardt. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 1042-1045.

Method of preparation. Graphs, tables. 17 ref.

**10779* Fischer-Tropsch Synthesis: A Study of the Reaction Mechanism.** N. G. Basak and K. K. Bhattacharyya. *Institute of Fuel, Journal* v. 27, Apr. 1954, p. 195-200.

Equilibrium state was reached on catalyst surface within short period. Effects of feed-gas composition, space velocity, and reduction of catalyst on utilization ratio and nature of products. Graphs, diagram. 23 ref.

**10780* Chemical Engineering. IX. Adsorption. X. Filtration.** D. C. Freshwater. *Institute of Petroleum Review*, v. 8, Apr. 1954, p. 79-81; May 1954, p. 95-97.

Theory, types, preparation, and methods of using absorbents and filters. Diagrams, table. 5 ref.

**10781* Fertilizer Formulation. Influence of Formulation on the Physical Properties of Fertilizers.** Forrest L. Turbett and James G. MacArthur. *Journal of Agricultural and Food Chemistry*, v. 2, May 12, 1954, p. 506-513.

Relates ammoniation solution composition to caking; moisture and degree of ammoniation are secondary. Photographs, graphs, tables. 16 ref.

**10782 Cellulose Acetate as a Raw Material for Rayon Production.** A. R. Urquhart. *Journal of Applied Chemistry*, v. 4, Apr. 1954, p. 195-203.

History of development. Present status in application and preparations. Graphs, table. 18 ref.

**10783* Mixed Fertilizer & Light Magnesia From Sea Bitterns.** K. Seshadri and J. Gupta. *Journal of Scientific & Industrial Research*, v. 13, sec. B, Mar. 1954, p. 204-210.

Reaction between ammonium carbonate and Mg salts used for fixing free $NH_3$ with bittern in preparation of nitrogenous fertilizer containing potash. Tables, diagram. 8 ref.

**10784* Investigation of Colors and Dyes Used in Process of Leather Coloring.** Joseph A. Casnocha. *Leather and Shoes*, v. 127, May 8, 1954, p. 17, 23.

"Colors" and "dyes" are synonymous, but there are distinct differences for tanners.

**10785* New Experiments With Drying Equipment.** (German.) Saburo Kamei and Ryozo Toei. *Memoirs of the Faculty of Engineering, Kyoto University*, v. 16, no. 1, Jan. 1954, p. 14-48.

Study of tunnel, basin-type, and air-current dryers. Air-current type is suited for rapid drying of granular materials. Graphs, tables, diagrams. 7 ref.

**10786 Phillip's Pebble Heater Developed to Obtain More Petrochemicals From Thermal Cracking.** M. O. Kilpatrick, L. E. Dean, D. S. Hall, and K. W. Seed. *Oil and Gas Journal*, v. 53, May 10, 1954, p. 162-165.

Ethylene yield 50% greater than realized in tube furnaces. Tables, graphs, diagram, photograph.

**10787 More on the Fluid Coking Process.** H. Z. Martin, F. T. Barr, and R. W. Krebs. *Oil and Gas Journal*, v. 53, May 10, 1954, p. 166, 169-171.

Process is adaptation of fluidized-solids technique to coking of crude residua and similar low-grade oils. Advantages listed. Tables. 1 ref.

**10788 Model II Fluid Hydroformer Uses Shot-Catalyst Principle.** C. W. Tyson, E. W. Nicholson, and E. J. Gornowski. *Oil and Gas Journal*, v. 53, May 17, 1954, p. 122, 124-125, 127.

Equipment, techniques, and advantages. Diagrams, tables. 2 ref.

**10789 Fractionator Plate Symposium.** *Petroleum Engineer*, v. 26, May 1954, p. C5 + 20 pages.

Includes "Float Valve Bubble Trays", I. Earl Nutter; "Uniflux Fractionating Tray", V. O. Bowles; "Performance of Bubble Cap Trays", Ralph M. Young; "Turbogrid Tray in Fractionation"; "Perforated Plate Distillation Columns", D. C. Lee; and "Benturi Kaskade Tray", G. C. Thrift.

**10790 Sizing Refinery Distillation Equipment.** G. T. Atkins and G. W. Wilson. *Petroleum Refiner*, v. 33, May 1954, p. 144-150.

A quick, accurate method for designer. Diagram, graph, tables.

**10791 The Economics of Tank Failures.** F. A. Gitzendanner. *Petroleum Refiner*, v. 33, May 1954, p. 160-162.

Failures, about 32 per 110,000 tank-yr. service, are generally brittle-type. Some can be avoided. Tables. 2 ref.

### *Chemical Engineering*

**10792 The Boiling of Liquids.** J. W. Westwater. *Scientific American*, v. 190, June 1954, p. 64-66, 68.

Problems in transfer of heat from solids. Nuclear, transition, and film boiling. Photographs, graphs.

***See also:***
**10844** (oxidation of aromatic hydrocarbons)
**10997** (inspection of refinery equipment)
**11218** (gasification of light hydrocarbons)
**11934** (use of waste gas for $NH_3$ synthesis)
**12028** (generation of $ClO_2$)

## CHEMISTRY—ANALYTICAL AND INORGANIC

**10793* Determination of Magnesium or Zinc in Aluminum Alloys in High Vacuum.** (German.) P. Urech and R. Sulzberger. *Aluminium*, v. 30, no. 4, Apr. 1954, p. 163-164.

Development of two-stage method. Photograph.

**10794* Use of Ion-Exchange Methods in Water Analysis.** Calvin Calmon. *American Water Works Association, Journal*, v. 46, May 1954, p. 470-478.

Summary of past work, possibilities, limitations, and present methods. Tables. 26 ref.

**10795* Polarographic Determination of Fluoride. I. Basic Principles of Method: Applications to Cathode-Ray Polarograph.** B. J. MacNulty, G. F. Reynolds, and E. A. Terry. *Analyst*, v. 79, Apr. 1954, p. 190-197.

Based on depression by fluoride of polarographic step given by reduction of Aluminum-Solochrome Violet R.S. complex. Graphs, tables. 5 ref.

**10796* Identification of Hydroxylamine and Hydrazine by Paper Chromatography.** J. M. Bremner. *Analyst*, v. 79, Apr. 1954, p. 198-201.

Involves acidic solvents and identification by *RF* values and colors produced with picryl chloride and other reagents. Table. 11 ref.

**10797* The Determination of Glucosamine.** R. Belcher, A. J. Nutten, and C. M. Sambrook. *Analyst*, v. 79, Apr. 1954, p. 201-208.

Colorimetric method for determination based on reactions with acetylacetone and *p*-dimethyl-amino benzaldehyde. Method adapted for use with commercial instruments. Tables, diagram, graphs. 12 ref.

**10798* The Absorptiometric Determination of Tracers of Copper in Highly Purified Water.** E. N. Jenkins. *Analyst*, v. 79, Apr. 1954, p. 209-216.

Method for determination of Cu at low levels significant in Al corrosion. Tracers down to 0.001 p.p.m. can be measured. Tables. 14 ref.

**10799* Micro-Determination of Acetaldehyde as Its 2:4-Dinitrophenylhydrazone.** G. R. A. Johnson and G. Scholes. *Analyst*, v. 79, Apr. 1954, p. 217-219.

Colorimetric method using perchloric acid makes hydrazine more soluble. $CCl_4$ extracts less of unchanged reagent. Table. 9 ref.

**10800* The Photometric Determination of Tracers of Aluminium in Zinc.** E. F. Pellowe and F. R. F. Hardy. *Analyst*, v. 79, Apr. 1954, p. 225-229.

Rapid method for quantitative determination from 0.001 to 0.01% of Al by means of aluminon. Thioglycollic acid used as complexing agent to suppress interference from Fe, Cu, and Sn. Tables, graph. 2 ref.

**10801* Absorptiometric Determination of Iridium and Rhodium.** A. D. Maynes and W. A. E. McBryde. *Analyst*, v. 79, Apr. 1954, p. 230-238.

Analysis of solutions containing Ir and Rh together, without necessity of prior separation. Graphs, tables. 8 ref.

**10802 Spectrochemical Analysis of Aluminum Alloys Using Molten Metal Electrodes.** Leo D. Frederickson, Jr. and J. R. Churchill. *Analytical Chemistry*, v. 26, May 1954, p. 795-800.

Molten electrode for spark excitation is used. Application to sheet, tube, extrusions, etc., which are not usually amenable to accurate analysis by existing solid electrode procedures. Photographs, diagrams, table. 1 ref.

**10803 Quantitative Analysis of Niobium and Tantalum in Ores by Fluorescent X-Ray Spectroscopy.** William J. Campbell and Howard F. Carl. *Analytical Chemistry*, v. 26, May 1954, p. 800-805.

Ratios of Nb-Ta in oxides chemically separated from ores, several applications of internal standard techniques, and additive technique. Photograph, graphs, tables. 14 ref.

**10804 Some Interferences in Flame Photometry.** Roy D. Caton, Jr. and Raymond W. Bremner. *Analytical Chemistry*, v. 26, May 1954, p. 805-813.

Includes graphs, tables, diagrams, micrographs. 12 ref.

**10805 Infrared Absorption Bands Characteristic of the Oxirane Ring.** W. A. Patterson. *Analytical Chemistry*, v. 26, May 1954, p. 823-835.

Bands of 26 epoxy compounds were recorded from 2 to 15 $\mu$, in liquid state and in solution. Correlates wave length positions of bands and reactivities with acetic acid. Graphs, spectrograms, tables. 9 ref.

**10806 Analysis of Binary Solvent Mixtures of Conducting Solutions by a Radio-Frequency Method.** James L. Hall, John A. Gibson, Jr., Frank E. Critchfield, Harold O. Phillips, and Charles B. Seibert. *Analytical Chemistry*, v. 26, May 1954, p. 835-838.

Based upon relation of H.F. capacitance of an insulated cell to conductance and dielectric constant of solution within cell. Tables, graphs. 12 ref.

**10807 Determination of Residual Crag Herbicide 1 and Its Hydrolysis Products on Food Crops.** J. N. Hogsett and G. L. Funk. *Analytical Chemistry*, v. 26, May 1954, p. 849-853.

Quantitative estimation of as little as 0.18 mg. by measuring intensity of colored complex formed with methylene blue chloride. Tables, graph. 10 ref.

**10808 Determination of Tritium by Ion Current Measurement.** K. E. Wilzbach, A. R. Van Dyken, and Louis Kaplan. *Analytical Chemistry*, v. 26, May 1954, p. 880-883.

Method of measuring ion current with vibrating reed electrometer. Graphs, tables. 25 ref.

**10809 Gravimetric Determination of Fluorine as Lanthanum Fluoride.** Alexander L. Popov and George E. Knudson. *Analytical Chemistry*, v. 26, May 1954, p. 892-894.

Fluoride is converted to fluosilicic acid by a Willard-Winter distillation. La nitrate solution is added to completely precipitate fluoride and excess La is then determined. Tables. 6 ref.

**10810 Mass Spectrometric Determination of Thorium.** G. R. Tilton, L. T. Aldrich, and M. G. Inghram. *Analytical Chemistry*, v. 26, May 1954, p. 894-898.

Determination of Th in minerals of ingneous rocks is of importance in measurement of mineral age. Technique of isotope dilution is sensitive and precise. Graph, tables. 16 ref.

**10811 Determination of Bismuth in Pure Bismuth-Lead Eutectic Alloy.** Louis Silverman and Mary Shideler. *Analytical Chemistry*, v. 26, May 1954, p. 911-914.

Study of phosphate and cupferron precipitation techniques. Tables. 13 ref.

**10812 Determination of Aldrin and Dieldrin in Formulations by Partition Chromatography.** Herman F. Beckman. *Analytical Chemistry*, v. 26, May 1954, p. 922-924.

Procedure adapted determines these insecticides singly and in combination with DDT; and aldrin in combination with S. Tables. 5 ref.

**10813* Oxygen Determination in Solid Steel According to Gotta's Aluminum Diffusion Process.** (German.) Jean Massinon, Norbert Stoll, and Michel Urbain. *Archiv für das*

*Eisenhüttenwesen*, v. 25, nos. 3-4, Mar.-Apr. 1954, p. 107-113; disc., p. 113-114.

Results from three laboratories using hot-extraction process with different apparatus. Possibilities and difficulties of applying Gotta process to high-carbon and alloyed steels. Tables, micrographs, diagrams. 10 ref.

**10814* The Estimation of Serum Proteins by Electrophoresis on Filter Paper.** J. Hardwicke. *Biochemical Journal*, v. 57, May 1954, p. 166-171.

Variables inherent in this method were critically examined. Diagrams, graphs, tables, photographs. 13 ref.

**10815 High Resolution Raman Spectroscopy of Gases. I. Experimental Methods.** B. P. Stoicheff. *Canadian Journal of Physics*, v. 32, May 1954, p. 330-338.

Apparatus obtains intense Raman spectra of gases excited by Hg 4358 line. Lines are sharp, a resolving power of about 100,000 achieved. Diagrams. 12 ref.

**10816* Filter Papers of New-Type Raw Materials in the Analytical Laboratory.** (German.) Auguste Grüne. *Chemie-Ingenieur-Technik*, v. 26, no. 4, Apr. 1954, p. 221-224.

Glass or porcelain frits and paper filters with varying penetrability. Membrane filters for micro-bacteriological work. New polyvinyl chloride base for filtering strong acid solutions. Tables. 5 ref.

**10817 A Rapid Method for the Determination of Copper in Plant Material.** T. R. Williams and R. R. T. Morgan. *Chemistry & Industry*, 1954, no. 16, Apr. 17, p. 461.

Use of bis-*cyclo*hexanone-oxlyldihydrazone as sensitive reagent for Cu. Tables. 2 ref.

**10818* Polarographic Determination of Monochlorinated Cyclanones.** (French.) Jean-Charles Pariaud and Claude Perruche. *Comptes rendus*, v. 238, no. 14, Apr. 5, 1954, p. 1514-1516.

Reduction of monochloro-cyclopentanone and monochlorohexanone. Graph.

**10819*** (A New Method of Infra-Red Absorption Analysis. Selective Modulation.) **Sur une nouvelle méthode d'analyse par absorption infrarouge.** Karl Friedrich Luft. *Comptes rendus*, v. 238, no. 16, Apr. 21, 1954, p. 1651-1653.

Functioning of infra-red analyzer with a filtering action. Diagram.

**10820* Quantitative Analysis of Polyisoprene by Means of Infra-Red Spectra.** (Russian.) E. I. Pokrovskii and M. V. Vol'kenshtein. *Doklady Akademii Nauk SSSR*, v. 95, no. 2, Mar. 11, 1954, p. 301-303.

Relative error in determination of coefficient of absorption does not exceed 0.3%. Graphs, tables. 1 ref.

**10821 Potentiometric Titration of Ammines of Rhodium, Iridium, and Platinum With Solutions of Potassium and Potassium Amide in Liquid Ammonia.** George W. Watt, Gregory R. Choppin, and James L. Hall. *Electrochemical Society, Journal*, v. 101, May 1954, p. 235-238.

Reduction of ammines of transitional metal bromides. Graphs. 5 ref.

**10822 A Gravimetric Method of Gas Analysis.** J. Morsing. *Iron and Steel Institute, Journal*, v. 177, May 1954, p. 175-182.

Simultaneous determination of $H_2S$, $CO_2$, O, unsaturated hydrocarbons, H, CO, methane, ethane, and N (by difference) in fuel gases. Diagrams, photograph, tables. 20 ref.

**10823* Determination of Carbon & Hydrogen by Calorimeter Bomb.** R. K. S. Mehta. *Journal of Scientific & Industrial Research*, v. 13, sec. B, Mar. 1954, p. 195-203.

Suitable for all fuels, especially volatile fuels difficult to handle by normal combustion technique. Graphs, tables, diagrams. 12 ref.

**10824* The Chromatographic Separation of Molybdenum (VI). Qualitative and Quantitative Interpretation of the Chromatogram.** (Hungarian.) Gyula Almássy and János Straub. *Magyar Kémiai Folyóirat*, v. 60, no. 4, Apr. 1954, p. 104-106.

Details and solvent composition. Table, charts, photograph.

**10825*** (New Photometric Determination of Iron in Analysis of Copper Alloys.) **Neue photometrische Eisenbestimmung bei der Analyse von Kupferlegierungen. I.** (Principle of the Process and Working Methods.) **Grundlagen des Verfahrens und der Arbeitsmethodik.** W. Nielsch and G. Boltz. *Metall*, v. 8, no's 9-10, May 1954, p. 374-378.

Effects of pH values, $NaIO_4$, tartaric acid, buffer salts, and NaCl. Tables, graphs.

**10826 Analytical Methods for Titanium and Titanium Alloys.** J. A. Corbett. *Metallurgia*, v. 49, no. 294, Apr. 1954, p. 206-208.

12 ref.

**10827*** (Spectrographic Analysis of Aluminum in 75% Ferrosilicon.) **Aanalisi spettrografica dell'alluminio nel ferrosilicio al 75%.** Alessandro Giavino. *Metallurgia italiana*, v. 46, no. 3, Mar. 1954; *Atti notizie (AIM)*, v. 9, no. 3, Mar. 1954, p. 79-82.

Quantitative analysis of pressed powders. Tables, graphs, diagram. 3 ref.

**10828*** (The Chemistry of $NH_2$ Radical.) **Zur Chemie des $NH_2$-Radikals. II.** E. Abel. *Monatshefte für Chemie*, v. 85, no. 2, Apr. 15, 1954, p. 441-452.

Redox behavior and reaction with $HNO_2$. Rate and mechanism of iodine reactions with hydrazine and hydroxylamine. Tables. 63 ref.

**10829 Infrared Analysis of Liquids.** L. W. Herscher. *Petroleum Processing*, v. 9, May 1954, p. 740-746.

Spectrometer analyzer determines minor concentrations of ortho-isomer in liquid stream of *m*- and *p*-ethyl toluene. Diagrams, photographs, graphs. 3 ref.

**10830 Analytical Determination of Trace Constituents in Metal Finishing Effluents. III. The Colorimetric Determination of Copper in Effluents.** Donald G. Gardner, Ralph F. Muraca, and Earl J. Serfass. *Plating*, v. 41, May 1954, p. 487-490.

Procedure applicable in range of 5 to 50 p.p.m., yields satisfactory results in presence of as much as 5000 p.p.m. of each of 20 cations in simultaneous admixture as well as in presence of organic materials and phosphates. Tables. 2 ref.

**10831* On the Theory of Aromatic Substitution. IV. The Orienting Influence of Substituents in Naphthalene Derivatives. V. Note on the Use of Hammett's Equation for the Correlation of Rates of Electrophilic and Nucleophilic Substitution Reactions.** (English.) F. L. J. Sixma. *Recueil des travaux chimiques des Pays-Bas*, v. 73, no. 4, Apr. 1954, p. 235-248.

Includes tables, graphs. 38 ref.

**10832 Mass Spectrometry in the Electronics Industry.** Thomas G. Polanyi. *Sylvania Technologist*, v. 7, Apr. 1954, p. 51-58.

Techniques used to derive bond dissociation energies, ionization potentials, electron affinities, and other quantities of major importance in physics and theoretical chemistry. Diagrams, photographs, tables. 62 ref.

**10833* Modern Infra-Red Spectroscopy.** (German.) W. Lüttke and F. Oswald. *Umschau in Wissenschaft und Technik*, v. 54, no. 8, Apr. 15, 1954, p. 229-232.

Application in determining molecular structures, qualitative analysis, hydrocarbon synthesis, and chemistry of plastics. Graphs.

**10834* Chromatographic Method in Qualitative Analysis. II.** (Russian.) K. M. Ol'shanova and K. V. Chmutov. *Zhurnal Analiticheskoi Khimii*, v. 9, no. 2, Mar.-Apr. 1954, p. 67-75.

Detects cations of the fourth analytical group when jointly present. Tables. 5 ref.

***See also:***

**11203** (determination of Zn)
**11289** (spectrographic spark source)

## CHEMISTRY—ORGANIC

**10835 Alkaline-Catalyzed Reaction of Formaldehyde and the Methylols of Phenol; A Kinetic Study.** James H. Freeman and C. W. Lewis. *American Chemical Society, Journal,* v. 76, Apr. 20, 1954, p. 2080-2087.

Paper chromatography permits detection of each methylolphenol formed from four phenols with formaldehyde. Graphs, table. 22 ref.

**10836 The Kinetics of the Oxidation of Phenyl Sulfoxide.** H. Harry Szmant, Hugh F. Harnsberger and Francis Krahe. *American Chemical Society, Journal,* v. 76, Apr. 20, 1954, p. 2185-2187.

Studies with perbenzoic and peracetic acids. Tables. 14 ref.

**10837 Synthesis and Properties of Deuterocarbons. Benzene-$d_6$ and Cyclohexane-$d_{12}$.** Joseph A. Dixon and Robert W. Schiessler. *American Chemical Society, Journal,* v. 76, Apr. 20, 1954, p. 2197-2199.

Deuteration to 99.3 and 98.8% respectively is attained with $D_2SO_4$. Table. 12 ref.

**10838 The Cleavage Reaction of 1,3-Diols. I. II. The Synthesis, Cleavage and Proof of Configuration of Two Pairs of Diastereomeric Secondary-Tertiary 1,3-Diols. III. The Synthesis of a Pair of Diastereomeric Ditertiary 1,3-Diols and an Effect of Configuration on Mode of Cleavage.** Howard E. Zimmerman and James English, Jr. *American Chemical Society, Journal,* v. 76, May 5, 1954, p. 2285-2300.

Includes table. 66 ref.

**10839 Synthesis and Fungistatic Activity of Some 3-Hydroxybiphenyl Derivatives.** Charles K. Bradsher, Frances C. Brown, and Hardin K. Porter. *American Chemical Society, Journal,* v. 76, May 5, 1954, p. 2357-2362.

Preparation and toxicity of 29 compounds, against *Aspergillus niger.* Tables. 19 ref.

**10840 The Peracid Oxidation of Linoleic Acid.** A. F. McKay, N. Levitin, and R. Norman James. *American Chemical Society, Journal,* v. 76, May 5, 1954, p. 2383-2386.

Resulting isomeric sativic acid esters separated and characterized by infra-red spectra. Spectrograms. 22 ref.

**10841 On the Periodic Acid Oxidation of Diethanolamine.** Manning A. Smith and B. R. Willeford, Jr. *American Chemical Society, Journal,* v. 76, May 5, 1954, p. 2502.

Produces formaldehyde, not formic acid. 7 ref.

**10842 Oxidation of Hydrazine in Solution.** John W. Cahn and Richard E. Powell. *American Chemical Society, Journal,* v. 76, May 5, 1954, p. 2568-2572.

Hydracyl radical is first formed according to mass spectrometric study of $N^{15}$ labeled $N_2H_4$ with several oxidants. Graphs. 11 ref.

**10843 Organic Deuterium Compounds. XI. Synthesis of 1-Chloro-1-Alkynes and 1-Chloro-1-Propyne-$d_3$.** A. T. Morse and L. C. Leitch. *Canadian Journal of Chemistry,* v. 32, May 1954, p. 500-505.

Dehydrohalogenation with KOH in butanol was used to prepare a number of new compounds with good yields. Graph. 18 ref.

**10844 Vapor Phase Oxidation of Aromatic Hydrocarbons.** John M. Weiss. *Chemical and Engineering News,* v. 32, May 3, 1954, p. 1820-1822.

Air is cheap starting material; but until markets are developed, use of this method will not expand beyond two products now in large scale production. Map.

**10845 Oxidation of Liquid Aldehydes by Molecular Oxygen.** James R. McNesby and Carl A. Heller, Jr. *Chemical Reviews,* v. 54, Apr. 1954, p. 325-346.

Data show a chain mechanism with free radicals forming a peracid which reacts with the aldehyde to form two acid molecules. System sensitive to contaminants. Tables. 47 ref.

**10846 Perfluoroalkyl Grignard and Grignard-Type Reagents. IV. Trifluoromethylmagnesium Iodide.** R. N. Haszeldine. *Chemical Society, Journal,* 1954, Apr., p. 1273-1279.

Mechanism of formation. Proper solvents and temperatures are needed.

**10847 The Kinetics and Mechanisms of Aromatic Halogen Substitution. I. Acid-Catalysed Chlorination by Aqueous Solutions of Hypochlorous Acid.** P. B. D. De La Mare, A. D. Ketley, and C. A. Vernon. *Chemical Society, Journal,* 1954, Apr., p. 1290-1297.

Includes tables, graphs.

**10848 The Influence of Alkyl Groups Upon Reaction Velocities in Solution. V. The Dissociation Contants of Ketone Cyanohydrins in Aqueous Alcohol. VI. The Acid-Catalysed Prototropy of Dialkyl Ketones.** D. P. Evans and J. R. Young. **VII. The Formation of Phenyltrialkylammonium Iodides in Methyl Alcohol.** David P. Evans. *Chemical Society, Journal,* 1954, Apr., p. 1310-1318.

Includes tables.

**10849 Some Aspects of the Industrial Development of Silicones.** J. H. E. Jeffes. *Chemistry & Industry,* 1954, no. 18, May, p. 498-501.

Methods of preparation, properties, and molecular structure. Graph, diagram, table. 11 ref.

**10850*** (Thermography of Peroxide Compounds.) **Termografiia perekisnykh soedinenii.** I. I. Vol'nov. *Doklady Akademii Nauk SSSR,* v. 94, no. 3, Jan. 21, 1954, p. 477-479.

Instrument permits rapid development of dissociation; a valuable preliminary indicator for heats of formation and structure of an entire series of peroxide compounds. Graphs. 7 ref.

**10851*** (New Method for the Synthesis of α-Iodoalkyltrialkylsilanes.) **Novyi metod sinteza α-iodalkiltrialkilsilanov.** V. A. Ponomarenko and V. F. Mironov. *Doklady Akademii Nauk SSSR,* v. 94, no. 3, Jan. 21, 1954, p. 485-488.

Method for synthesis simplifies multi-stage procedure of Whitmore. Diagram. 12 ref.

**10852* Chlorination of Dimethyldichlorsilane and Hexamethyldisiloxane.** (Russian.) K. A. Andrianov, Ia. I. Mindlin, and N. S. Leznov. *Doklady Akademii Nauk SSSR,* v. 94, no. 5, Feb. 11, 1954, p. 873-875.

Physical and chemical characteristics of reaction products. Table, diagram. 3 ref.

**10853* Synthesis of 1-Phenyl-1-(4-*tert* Butyl) Phenylethane Hydroperoxide Using Chromatographic Method for Its Separation.** (Russian.) K. S. Grigor'eva and T. I. Iurzhenko. *Doklady Akademii Nauk SSSR,* v. 94, no. 5, Feb. 11, 1954, p. 881-882.

Physical and chemical constants of intermediate products of synthesis and of the final compound. 8 ref.

**10854* Mechanism of Hydrogenation of Divinyl Acetylene.** (Russian.) V. I. Isaguliants, G. T. Esaian, A. G. Terzian, R. M. Oganesian, and N. M. Manasegian. *Doklady Akademii Nauk SSSR,* v. 94, no. 5, Feb. 11, 1954, p. 883-885.

Investigation in presence of an active Ni catalyst. Table. 13 ref.

**10855* Composition of Products From Thermal Decomposition of Unsaturated Hydrocarbons.** (Russian.) V. V. Voevodskii. *Doklady Akademii Nauk SSSR,* v. 94, no. 5, Feb. 11, 1954, p. 909-912.

Proposes new radical-chain mechanism for interpretation of olefin cracking. Table, graphs. 8 ref.

**10856* Influence of Boron Fluoride on the Orientation of the $NO_2$ Group in the Benzene Ring During Nitration of Phenol and Aniline.** (Russian.) A. V. Topchiev, V. P. Alaniia, and G. S. Shnaider. *Doklady Akademii Nauk SSSR,* v. 95, no. 1, Mar. 1, 1954, p. 89-92.

Data confirm theoretical hypothesis. Tables. 3 ref.

**10857* Isotopic Carbon Exchange Between Hydrocarbons in Presence of Aluminum-Silicate Catalyst.** (Russian.) B. V. Klimenok, E. A. Andreev, O. V. Krylov, and M. M. Sakharov. *Doklady Akademii Nauk SSSR,* v. 95, no. 1, Mar. 1, 1954, p. 101-103.

Exchange proceeds at a very slow rate. Photographs. 3 ref.

**10858* Mutual Influence of Atoms in Molecules of Certain Ethylene Hydrocarbons According to Experiments With Isotopic Exchange of Hydrogen.** (Russian.) A. I. Shatenshtein and L. N. Vasil'eva. *Doklady Akademii Nauk SSSR*, v. 95, no. 1, Mar. 1, 1954, p. 115-118.

Substantiates basic assumptions. Graph, table. 3 ref.

**10859* Synthesis of α-Chloromethyl-Alkoxysilanes and the Substitution of a Halide by Ester Groups.** (Russian.) K. A. Andrianov, L. I. Makarova, L. M. Volkova, and V. A. Odinets. *Doklady Akademii Nauk SSSR*, v. 95, no. 2, Mar. 11, 1954, p. 269-272.

Physical and chemical constants of 10 new compounds. Table. 3 ref.

**10860* Addition of Tertiary Halogenalkiles to Divinyl and Vinyl Acetylene.** (Russian.) A. A. Petrov and K. V. Leets. *Doklady Akademii Nauk SSSR*, v. 95, no. 2, Mar. 11, 1954, p. 285-288.

Additive reaction of butyl chloride, bromide, and iodide. 11 ref.

**10861*** (Physical and Chemical Properties of Silicon Hydrocarbons; Disilylmethane, 1,2-Disilylethane, Dipropylsilane, and Hexylsilane.) **Fizicheskie i khimicheskie svoistva kremneuglevodorodov (disililmetana, 1,2-disililetana, dipropilsilana i geksilsilana).** M. I. Batuev, V. A. Ponomarenko, A. D. Matveeva, and A. D. Petrov. *Doklady Akademii Nauk SSSR*, v. 95, no. 4, Apr. 1, 1954, p. 805-808 + 1 plate.

Compares properties of corresponding hydrocarbons. Micrographs, tables. 4 ref.

**10862*** (Investigations in the Field of Oxygen-Containing Silicon-Organic Compounds. Production of Diethyl Phenyl Silanechloride, Diethyl Phenyl Silanol, Tetramethyl Diphenyl Silicyl Oxide, and Some of Their Conversions.) **Issledovaniia v oblasti kislorodsoderzhashchikh kremniiorganicheskikh soedinenii.** M. F. Shostakovskii and D. A. Kochkin. *Doklady Akademii Nauk SSSR*, v. 95, no. 4, Apr. 1, 1954, p. 821-824.

Hydrolytic conditions. 3 ref.

**10863*** (Dark and Photochemical Interactions of Triphenyl Methane Dye Layers With Oxygen and Moisture.) **Temnovye i fotokhimicheskie vzanmodeistviia plenok trifenilmetanovykh krasitelei s kislorodom i vlagoi.** I. I. Dilung and B. Ia. Dain. *Doklady Akademii Nauk SSSR*, v. 95, no. 5, Apr. 11, 1954, p. 1001-1004.

Importance of O in fading phenomena. Association of light quanta with moist air accelerates fading process. Graphs. 1 ref.

**10864*** (The Structural Analysis of Mineral-Oil Hydrocarbons.) **Zur Frage der Strukturanalyse der Erdölkohlenwasserstoffe.** H. Umstätter. *Erdöl und Kohle*, v. 7, no. 4, Apr. 1954, p. 207-211.

Critical discussion of various methods. Tables, photographs, diagram, graphs. 14 ref.

**10865 The Interaction of Tanning Materials With Collagen Monolayers.** S. C. Ellis and K. G. A. Pankhurst. *Faraday Society, Discussions*, no. 16, 1954, p. 170-179.

Reactions between materials dissolved in underlying liquid were followed by changes in surface pressure, surface potential, and surface viscosity. Graphs. 21 ref.

**10866*** (Mazzoni Method for Continuous Production of Soap Under Vacuum.) **Kontinuierliche Seifen-Herstellung unter Vakuum nach Mazzoni.** A. Lanteri. *Fette, Seifen, Anstrichmittel*, v. 56, no. 4, Apr. 1954, p. 250-252.

Operation and effect of cooling rate on crystallization. Graph. 12 ref.

**10867* Magnetochemistry of Petroleum. II. Magnetic Constants and Rings and Ramifications for Hydrocarbons.** (Japanese.) Hidemasa Honda. *Fuel Society of Japan, Journal*, v. 33, no. 323, Mar. 1954, p. 134-143.

Number of rings and density correlated. Magnetic susceptibility relations. Graphs, tables. 12 ref.

**10868 Reaction of Aldehyde and Hydrogen Peroxide in Aqueous Solution.** Charles N. Satterfield and Leslie C. Case. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 998-1001.

Kinetics of reaction using acetaldehyde primarily, also with formaldehyde and propionaldehyde. Table, graphs. 6 ref.

**10869 Partial Oxidation of Propane. The Role of Hydrogen Peroxide.** Charles N. Satterfield and Robert E. Wilson. **Separation of Hydrogen Peroxide From the Products.** Charles N. Satterfield, Robert E. Wilson, Theodore W. Stein, and Dale O. Cooper. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 1001-1010.

Includes diagram, tables, graphs. 40 ref.

**10870* Linear Structural Formulae.** Godfrey Claxton and Peter Kerr. *Institute of Petroleum Journal*, v. 40, May 1954, p. 133-137.

Advantages of linear form in typing and printing.

**10871 A Comparison of the Solubilization of Several Paraffin Hydrocarbons by a Polysoap.** Lionel H. Layton and Ulrich P. Strauss. *Journal of Colloid Science*, v. 9, Apr. 1954, p. 149-156.

Solubilized components prepared by partial quaternization of poly-2-vinylpyridine with *n*-dodecyl bromide, were studied viscosimetrically to determine chain length and branching of the hydrocarbons. Graphs, tables. 12 ref.

**10872* Photosynthesis by Protoplasm Extruded From Chara and Nitella.** N. E. Tolbert and L. P. Zill. *Journal of General Physiology*, v. 37, May 1954, p. 575-588.

Fixation in light or dark of $NaHC^{14}O_3$ at appreciable rates, not only by whole or cut cells, but also by the protoplasm extruded from these cells. Makes possible observation of photosynthesis at significant rates by protoplasm outside the cell wall. Radiograms, graphs. 17 ref.

**10873 Further Studies on 4-Quinolizone Derivaties.** V. Boekelheide and Walter G. Gall. *Journal of Organic Chemistry*, v. 19, Apr. 1954, p. 499-503.

Shows that 4-methyl mercapto-dehydro quinolizinium iodide is a useful reagent for preparing compounds containing the dehydro quinolizinium nucleus. Graph. 6 ref.

**10874 The Conversion of Liloline Derivatives to Quinolinum Salts Using Cyanogen Bromide.** V. Boekelheide and Walter G. Gall. *Journal of Organic Chemistry*, v. 19, Apr. 1954, p. 504-509.

Possible utility in a synthesis of degradation products of apo-β-erythroidine. Reaction with cyanogen bromide does not lead to ring cleavage but results in oxidation to corresponding quinolinium bromides. 9 ref.

**10875 A Study of Kolbe-Schmitt Reaction. , II. The Carbonation of Phenols.** Ogden Baine, G. F. Adamson, J. W. Barton, J. L. Fitch, D. R. Swayampati, and Horald Jeskey. *Journal of Organic Chemistry*, v. 19, Apr. 1954, p. 510-514.

Results compared with respect to yield of hydroxy acid. Tables. 8 ref.

**10876 Stereospecific Reactions of the Diphenacyl Halides.** Harry H. Wasserman and Joyce B. Brous. *Journal of Organic Chemistry*, v. 19, Apr. 1954, p. 515-521.

Reactions with aniline and hydrazine; assignment of *cis*- and *trans*-configurations to parent β- and α-epoxy ketones. Spectrogram. 7 ref.

**10877 The Halodiphenacyls. I.** Calvin L. Stevens, Robert J. Church, and Vincent J. Traynelis. **II. Stereochemistry.** Calvin L. Stevens and Vincent J. Traynelis. *Journal of Organic Chemistry*, v. 19, Apr. 1954, p. 522-537.

Structures correlated by physical and chemical means. Table, graphs, spectrograms. 14 ref.

**10878 The Bromination of Diphenylacetone and Subsequent Solvolysis Reactions.** Calvin L. Stevens and Carl T. Lenk. *Journal of Organic Chemistry*, v. 19, Apr. 1954, p. 538-543.

Results at low temperatures in chloroform or ether gave 1-bromo-1,1-diphenyl-2-propanone in high yield. At high temperatures in acetic acid the corresponding 3-bromo ketone was produced in high yield. 13 ref.

## *Chemistry—Organic*

**10879 Some New Phenyltrialkoxysilanes.** Robert Filler. *Journal of Organic Chemistry,* v. 19, Apr. 1954, p. 544-547.

Preparation and properties of five new members; data for two previously reported compounds of this series. 15 ref.

**10880 Mechanism of the Reaction of Mono-Olefins With Dienophiles. I. Allylbenzene and Arylmaleic Anhydrides.** Christian S. Rondestvedt, Jr. and Allen H. Filbey. *Journal of Organic Chemistry,* v. 19, Apr. 1954, p. 548-559.

Reaction is initiated by attack of negative end of olefin on relatively positive double bond of maleic anhydride. Spectrograms. 20 ref.

**10881 Some Derivatives of 10-Alkylphenothiazines.** Henry Gilman, Robert K. Ingham, John F. Champaigne, Jr., Justin W. Diehl, and Ralph O. Ranck. *Journal of Organic Chemistry,* v. 19, Apr. 1954, p. 560-569.

Sodamide-condensation type of reaction applied to preparations of 10-(*n*-propyl)-, 10-isopropyl-, and 10-(*p*-methoxybenzyl)-phenothiazine. Tables. 13 ref.

**10882 Puromycin. Synthetic Studies. I. Synthesis of 6-Dimethylaminopurine, an Hydrolytic Fragment.** B. R. Baker, Joseph P. Joseph, and Robert E. Schaub. **II. The Position of Glycosidation on the 6-Dimethylaminopurine Moiety.** B. R. Baker, Robert E. Schaub, and Joseph P. Joseph. **III. Synthesis of 3-Amino-d-Ribose, and Hydrolytic Fragment.** B. R. Baker and Robert E. Schaub. *Journal of Organic Chemistry,* v. 19, Apr. 1954, p. 631-660.

Experimental procedure and results. Tables. 39 ref.

**10883* Synthetic Experiments in the Benzopyrone Series. XL. Synthesis of 2-Hydroxymethyl Chromones.** Ishwar Dass, J. M. Sehgal, and T. R. Seshadri. **XLV. Nuclear Methylation in Hydroxy Isoflavones.** R. Iengar, A. C. Mehta, T. R. Seshadri, and S. Varadarajan. *Journal of Scientific & Industrial Research,* v. 13, sec. B, Mar. 1954, p. 160-174.

Method of prepaartion using *N*-bromosuccinimide. 32 ref.

**10884* The Fries Reaction. IV. The Rearrangement of the Derivatives of Salicylic Acid & Substituted Benzoic Acids.** J. H. Amin and R. D. Desai. **VI. The Rearrangement of Aryl p-Toluene-Sulphonates and a Convenient Method for the Synthesis of Hydroxy-Diarylsulphones.** J. H. Amin, R. D. Desai, K. Parekh, and K. Venkataraman. *Journal of Scientific & Industrial Research,* v. 13, sec. B, Mar. 1954, p. 178-183.

Experimental procedure and results. 13 ref.

**10885* Mechanism of Emulsification.** (Russian.) L. Ia. Kremnev and A. A. Ravdel. *Kolloidnyi Zhurnal,* v. 16, no. 1, Jan.-Feb. 1954, p. 17-28.

Analysis of deformation and spontaneous disintegration of drops. Dispersion and emulsion aging. Graphs, tables. 10 ref.

**10886 Mechanical Leather.** Alfred S. Berens. *Machine Design,* v. 26, May 1954, p. 140-143.

Impregnated leather offers packings with low porosity and leakage; high mechanical strength; heat and solvent resistance. Graphs, photographs.

**10887* Oxidation of Ethane and Propane by Certain Forms of Mycobacteria.** (Russian.) Ek. N. Bokova. *Mikrobiologiia,* v. 23, no. 1, Jan.-Feb. 1954, p. 15-21.

Includes table. 14 ref.

**10888 Reactions of Methaemo-Globin and Catalase With Peroxides and Hydrogen Donors.** D. Keilin and E. F. Hartree. *Nature,* v. 173, Apr. 17, 1954, p. 720-723.

Results of experiments having direct bearing upon mechanism of catalatic decomposition of $H_2O_2$ to molecular O and water. 26 ref.

**10889 Mechanism of Anionotropy.** E. A. Braude, D. W. Turner, and E. S. Waight. *Nature,* v. 173, May 8, 1954, p. 863-865.

Condensed from a paper presented at a symposium on "Molecular Rearrangements in Organic Chemistry", Queen Mary College, London, Apr. 1954. Considers unimolecular, bimolecular and intramolecular mechanisms. Graphs. 26 ref.

**10890 Advances in Protein Chemistry.** G. R. Tristram. *Research,* v. 7, May 1954, p. 178-189.

Amino acid constituents of various proteins, methods of isolating individual components, and structural arrangement in molecule. Tables, graphs. 66 ref.

**10891*** (The Stability of Organic Molecules Under Electron Impact.) **Über die stabilität organischer Moleküle bei Elektronenstoss.** M. Pahl. *Zeitschrift für Naturforschung,* v. 9b, no. 3, Mar. 1954, p. 188-203.

Results indicate correlation between resistance to electron impact and molecular structure. Tables, graphs. 19 ref.

**10892*** (Theoretical Explanation of Smittenberg and Mulder's Emperically Derived Density Relations Within Homologous Series of Hydrocarbons.) **Uber die theoretische Bergründung der von Smittenberg und Mulder empirisch hergeleiteten Dichtebeziehungen innerahalb homologer Kohlenwasserstoffreihen.** K. Wisseroth. *Zeitschrift für Naturforschung,* v. 9b, no. 3, Mar. 1954, p. 204-206.

Volume and packing relationships of the molecules. Diagram, tables. 4 ref.

**10893* Kinetics and Mechanism of Dissociation of Hydrocarbons. III. Kinetics and Mechanism of Dissociation of Butane at Low Pressures in the Presence of Isobutylene and Propylene Used as Inhibitors.** (Russian.) A. D. Stepukhovich and A. M. Chaikin. *Zhurnal Fizicheskoi Khimii,* v. 27, no. 12, Dec. 1953, p. 1737-1747.

Includes tables, graphs. 18 ref.

**10894* Separation of Mixtures of Hydrocarbons by the Chromothermographic Method.** (Russian.) N. M. Turkel'taub, V. P. Shvartsman, T. V. Georgievskaia, O. V. Zolotareva, and A. I. Karymova. *Zhurnal Fizicheskoi Khimii,* v. 27, no. 12, Dec. 1953, p. 1827-1836.

Method permits rapid separation and analysis of seven-component mixtures of hydrocarbons. Graphs, diagrams. 4 ref.

**10895* Geometry of Linear Polymers. IV. Stereoisomery of Polymer Chains.** (Russian.) T. M. Birshtein and O. B. Ptitsyn. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 2, Feb. 1954, p. 213-223.

Influence of asymmetric pendants on average molecular size. Diagrams. 17 ref.

**10896* Mechanism of the Oxidation of Hydrocarbons in the Gaseous Phase. IV. Upper and Lower Temperature Oxidation of Propane.** (Russian.) N. Ia. Cherniak, V. L. Antonovskii, A. F. Revzin, and V. Ia. Shtern. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 2, Feb. 1954, p. 240-253.

Includes tables, graphs. 17 ref.

**10897*** (Photochemical Reactions of Carbon Tetrachloride With Vinyl Compounds.) **Fotokhimicheskii reaktsii chetyrekhkhloristogo ugleroda s vinilovymi soedineniiami.** Kh. S. Bagdasar'ian and R. I. Miliutinskaia. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 3, Mar. 1954, p. 498-506.

Increase in rate of polymerization and addiiton of $CCl_4$ at the double bond. Behavior of styrene and vinyl butyl ether. Graphs, table. 7 ref.

**10898*** (Investigation of Infra-Red Absorption Spectra of Silicon-Organic Compounds.) **Issledovanie infrakrasnykh spektrov pogloshcheniia kremniiorganicheskikh soedinenii.** A. P. Kreshkov. Iu. Ia. Mikhailenko, and G. F. Iakimovich. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 3, Mar. 1954, p. 537-551.

Investigation of 11 compounds in spectral range of 2 to 11. Tables, graphs, 21 ref.

**10899* Homologs of Monovinylacetylene. III. Cyclic Diene Esters.** (Russian.) I. A. Favorskaia and L. V. Fedorova. *Zhurnal Obshchei Khimii,* v. 24, no. 2, Feb. 1954, p. 242-251.

Includes graphs, tables. 20 ref.

**10900* Investigation of the Nature of Catalysts Utilized for the Isomerization and Polymerization of Hydrocarbons. I. Problem of Cause of Catalytic Activity of Titanic Acid.**

(Russian.) G. A. Rudakov and Z. S. Khomenko. *Zhurnal Obshchei Khimii*, v. 24, no. 2, Feb. 1954, p. 337-343.

Includes tables, graphs. 14 ref.

**10901* Synthesis and Physilogical Activity of Isopropyl Esters of Certain Aryl Carbamine Acids in Plants.** (Russian.) Iu. A. Baskakov and N. N. Mel'nikov. *Zhurnal Obshchei Khimii*, v. 24, no. 2, Feb. 1954, p. 376-379.

Hydrogen exchange in phenol radical of phenyl*iso*propyl carbamate influences activity of the compound. Table. 15 ref.

*See also:*
**10650** (production of rodenticides)
**10818** (reduction of cyclanones)
**10833** (infra-red spectroscopy)
**10920** (dehydrogenation of dipentane)
**10922** (interaction of aromatic hydrocarbons)
**10951** (cracking of hydrocarbons)
**10955** (review of 1953 literature on fats, oils, and soaps)

## CHEMISTRY—PHYSICAL

**10902 Solvent Effects in the Iodide-Iodine-Triiodide Complex Equilibrium.** Leonard I. Katzin and Elizabeth Gebert. *American Chemical Society, Journal*, v. 76, Apr. 20, 1954, p. 2049-2054.

Ultra-violet spectroscopy shows $I_3$ ion to be more stable in non-aqueous media. Compares $NaI_3$ and $Bu_4NI_3$ in dry alcohol. Graphs, tables. 34 ref.

**10903 Chemical Reactions in Strong Shock Waves.** Edward F. Greene. *American Chemical Society, Journal*, v. 76, Apr. 20, 1954, p. 2127-2131.

Waves made in a shock tube with a Cellophane diaphragm decompose $CH_2I$ and BrCN. Photograph, graphs, diagrams. 9 ref.

**10904 Absolute Quantum Yields for Dissociation of Iodine in Inert Solvents.** Frederick W. Lampe and Richard M. Noyes. *American Chemical Society, Journal*, v. 76, Apr. 20, 1954, p. 2140-2144.

Free iodine atoms cause allyl iodide to lose its I to form $I_2$. Light of 4358 A is used to cause a quantum decomposition of allyl iodide and $I_2$ in $C_6H_{12}$, $CCl_4$, and hexachloro butadine-1,3. Tables, graphs. 12 ref.

**10905*** (The Dependence of Electrical Conductivity of Titanium Dioxide on the Contents of Foreign Ions of Different Valence.) **Zur Abhängigkeit der elektrischen Leitfähigkeit von Titandioxyd vom Gehalt an anderswertigen Fremdionen.** Horst Grunewald. *Annalen der Physik*, v. 14, nos. 3-5, Feb. 15, 1954, p. 121-128.

Influence of $WO_3$ and $Cr_2O_3$ additions at various temperatures. Graphs. 8 ref.

**10906 Molecular Weight and Hydrodynamic Properties of Sodium Alginate.** W. H. Cook and David B. Smith. *Canadian Journal of Biochemistry and Physiology*, v. 32, May 1954, p. 227-239.

Sedimentation, diffusion, and viscosity measurements on five unfractionated samples with intrinsic viscosity from 3.1 to 17.5. Tables, graphs. 29 ref.

**10907 Hydrogen Peroxide and Its Analogues. V. Phase Equilibria in the System $D_2O$-$D_2O_2$.** Paul A. Giguère and E. A. Secco. *Canadian Journal of Chemistry*, v. 32, May 1954, p. 550-556.

Cooling curves of solutions of deuterium peroxide in heavy water in concentration range 11 to 95% were measured to determine solid-liquid phase diagram. Tables, graph. 22 ref.

**10908 Determination of the Concentration of Intermediaries and of Rate Constants in Radical Reactions.** G. M. Burnett and H. W. Melville. *Chemical Reviews*, v. 54, Apr. 1954, p. 225-288.

Spectral detection, applicable gas-phase methods, gas- and liquid-phase techniques, aspects of chain reactions, and emulsion polymerization. Diagram, graphs, tables. 155 ref.

**10909* On Silicones. XXII. Determination of Specific Heats of Silicone Oil.** (German.) H. Reuther and Chr. Maass. *Chemische Technik*, v. 6, no. 3, Mar. 1954, p. 127-129.

Values frequently stated in literature are low. Effect of organic substituents in the silicone molecule is secondary. Tables, diagram. 10 ref.

**10910 The Expected Life on Anion Exchangers.** Louis Wirth, Jr. *Combustion*, v. 25, May 1954, p. 49-54; disc., p. 54.

Compilation of operating data for estimating resin life. Graphs, tables. 7 ref.

**10911* Depolymerization of Macromolecules Under Simultaneous Effect of Ultrasonic and Electric Fields.** (French.) Pierre Renaud and Jean Saddy. *Comptes rendus*, v. 238, no. 13, Mar. 29, 1954, p. 1393-1394.

Action on pyridine solutions. Tables.

**10912* Study of Titanium-Hydrogen Systems. Preparation of a Titanium Hydride.** (French.) André Chrétien, William Freundlich, and Michel Bichara. *Comptes rendus*, v. 238, no. 13, Mar. 29, 1954, p. 1423-1424.

Chemical and radio crystallographic study of absorption of H by Ti. Graph.

**10913*** (Problem of Dielectric Losses in Alkaline-Haloid Crystals at High Frequency.) **K vosprosu o dielektricheskikh poteriakh v shchelochno-galoidnykh kristallakh na vysokoi chastote.** A. A. Vorob'ev and K. A. Vodop'ianov. *Doklady Akademii Nauk SSSR*, v. 94, no. 3, Jan. 21, 1954, p. 429-432.

Dependence on energy of activation, lattice energy and constant, heat of formation, and heat of sublimation. Table. 6 ref.

**10914*** (Relationship Between Constants of "Anharmonicity" and Frequencies of Isotopic Molecules.) **Sootnosheniia mezhdu postoiannymi angarmonichnosti i chastotami izotopnykh molekul.** L. M. Sverdlov. *Doklady Akademii Nauk SSSR*, v. 94, no. 3, Jan. 21, 1954, p. 451-454.

Includes tables. 6 ref.

**10915*** (Solubility Isotherms of the Ternary System Chloride-Lithium Sulfate-Water at 25 C.) **Izoterma rastvorimosti troinoi sistemy khlorid-sul'fat litiia-voda pri 25°.** I. G. Druzhinin and A. P. Ianko. *Doklady Akademii Nauk SSSR*, v. 94, no. 3, Jan. 21, 1954, p. 481-483.

Method of plotting diagrams. Results indicate possibility of quantitative precipitation of $Li_2SO_4$ from saturated solutions of LiCl. Table, graph. 4 ref.

**10916*** (Reactivity of Hydrogen Sorbed by a Raney Nickel Catalyst.) **O reaktsionnoi sposobnosti vodoroda, sorbirovannogo skeletnym nikelevym katalizatorom.** D. V. Sokol'skii and S. T. Bezverkhova. *Doklady Akademii Nauk SSSR*, v. 94, no. 3, Jan. 21, 1954, p. 493-496.

Kinetics of hydration of dimethyl acetylene, carbinol, *o*-nitrophenol, and acetylene. Tables, graphs. 12 ref.

**10917*** (Adsorption of Surface-Active Substances and of Hydrogen-Liberation Overvoltage on a Solid Mercury Surface.) **Adsorbtsiia poverkhnostno-aktivnykh vestchestv i perenapriazhenie vydeleniia vodoroda na tverdoi rtutnoi poverkhnosti.** V. L. Kheifets and B. S. Krasikov. *Doklady Akademii Nauk SSSR*, v. 94, no. 3, Jan. 21, 1954, p. 517-518.

Results confirm differences in adsorption of surface-active substances on uniform and heterogeneous surfaces. Graphs. 2 ref.

**10918* Catalytic Activity of Metals of the 4th Period in Relation to Interaction Between Hydrogen and Oxygen.** (Russian.) G. K. Boreskov, M. G. Slin'ko, A. G. Flippova, and R. N. Gur'ianovo. *Doklady Akademii Nauk SSSR*, v. 94, no. 4, Feb. 1, 1954, p. 713-715.

Experimental investigation on Ti, V, Cr, Mn, Fe, Co, Ni, Cu, and Zn. Table, graph. 1 ref.

**10919* Influence of Hydrogen on the Photoconductivity of Solid Layers of Dyes.** (Russian.) A. T. Vartanian. *Doklady Akademii Nauk SSSR*, v. 94, no. 5, Feb. 11, 1954, p. 829-832.

Detection and establishment of nature of interaction between molecules of a dye and a foreign substance. Diagram. 5 ref.

## *Chemistry—Physical*

**10920* Dehydrogenation and Irreversible Catalysis of Dipentene Using Vanadium Oxides as the Catalyst.** (Russian.) S. R. Rafikov, B. V. Suvorov, and L. K. Tuturova. *Doklady Akademii Nauk SSSR*, v. 94, no. 5, Feb. 11, 1954, p. 895-897.

Individual hydrocarbons separated in pure form identified by physical and chemical constants. Graphs. 14 ref.

**10921* Nature of Adsorption of Nitrogen Vapors on Quartz and Silica Gels.** (Russian.) A. P. Karnaukhov, A. V. Kiselev, and E. V. Khrapova. *Doklady Akademii Nauk SSSR*, v. 94, no. 5, Feb. 11, 1954, p. 915-918.

Dependence of magnitude and heat of absorption on nature of the surface of the adsorbent and its structure. Table, graphs. 19 ref.

**10922* Interactions of Atoms in Molecules of Certain Aromatic Hydrocarbons According to the Experiments on Isotopic Hydrogen Exchange.** (Russian.) A. I. Shatenshtein and E. A. Izrailevich. *Doklady Akademii Nauk SSSR*, v. 94, no. 5, Feb. 11, 1954, p. 923-926.

Investigates toluene, ethyl-, isopropyl-*n*-, and *tert*-butyl-benzene. Tables. 5 ref.

**10923* Isotope Exchange of Hydrogen in Hydrocarbons in a Medium of Liquid Deuterium Fluoride.** (Russian.) Ia. M. Varshavskii and A. I. Shatenshtein. *Doklady Akademii Nauk SSSR*, v. 95, no. 2, Mar. 11, 1954, p. 297-299.

Includes table. 11 ref.

**10924*** (Thixotropy and Methods of Its Determination in Liquid-Plastic Colloid Systems.) **Tiksotropiia i metody ee otsenki v zhidko-plastichnykh kolloidnykh sistemakh.** A. A. Trapeznikov and V. A. Fedotova. *Doklady Akademii Nauk SSSR*, v. 95, no. 3, Mar. 21, 1954, p. 595-598.

Includes graphs. 14 ref.

**10925*** (Macroscopic Phases of Propane Oxidation in the Course of Catalysis by Nitrogen Oxides.) **Makroskopicheskie stadii pri katalize okislami azota reaktsii okisleniia propana.** Z. K. Maizus and N. M. Emanuel'. *Doklady Akademii Nauk SSSR*, v. 95, no. 5, Apr. 11, 1954, p. 1009-1011.

Two clearly defined heat-liberating cycles noted with short initial phase followed by a less effective one. Graphs. 16 ref.

**10926 The Physical Chemistry of Dyeing and Tanning. General Introduction.** Eric Rideal. *Faraday Society, Discussions*, no. 16, 1954, p. 9-13.

How dye is combined with fiber, conditions of equilibrium, and rate of dyeing. Graphs. 3 ref.

**10927 Atomic Models. III. Some Stereochemical Problems in Dyeing.** Conmar Robinson. *Faraday Society, Discussions*, no. 16, 1954, p. 125-132 + 4 plates.

Results obtained by considering steric factors in models of dye and fiber molecules when bound together in dyeing process. Table, photographs. 21 ref.

**10928* The Heats of Vaporization of the Elements.** E. C. Baughan. *Faraday Society, Transactions*, v. 50, Apr. 1954, p. 322-335.

Predicts heats of vaporization not yet known with precision. Anomalies cited. Tables, graph. 43 ref.

**10929* A Theory of the Electrical Double Layer and the Interpretation of Differential Capacity Curves.** M. A. V. Devanathan. *Faraday Society, Transactions*, v. 50, Apr. 1954, p. 373-385.

Method of calculating components of charge from differential capacity data permits verification of theory from published electrocapillary data. Graphs, tables, diagram. 8 ref.

**10930* The Mechanism of the Reaction at a $Cu/Cu^{2+}$ Electrode.** P. J. Hillson. *Faraday Society, Transactions*, v. 50, Apr. 1954, p. 385-393.

Includes graphs, tables, diagrams. 16 ref.

**10931* The Adosrption of Surface Active Electrolytes at the Air/Water Interface.** B. A. Pethica. *Faraday Society, Transactions*, v. 50, Apr. 1954, p. 413-421.

Includes graphs. 26 ref.

**10932 Electronegativities in Inorganic Chemistry. III.** R. T. Sanderson. *Journal of Chemical Education*, v. 31, May 1954, p. 238-245.

Method determines relative electro-negativities of atoms, molecules, and ions, and estimates partial charge on combined atoms. Tables, graphs. 12 ref.

**10933 Rates of Substitution Reactions in Oxyanions.** John O. Edwards. *Journal of Chemical Education*, v. 31, May 1954, p. 270-275.

Factors affecting rates of reaction. Tables. 56 ref.

**10934 Another Form of Alpha Ferric Oxide.** F. A. Steele. *Journal of Colloid Science*, v. 9, Apr. 1954, p. 166-174.

Includes table, graph, photomicrographs. 5 ref.

**10935*** (Experimental Contribution to Problem of Isotope Separation by the Chemical Method.) **Ein experimenteller Beitrag zum Problem der Isotopentrennung auf chemischem Wege.** G. Wagner, A. Pelz, and M. J. Higatsberger. *Monatshefte für Chemie*, v. 85, no. 2, Apr. 15, 1954, p. 464-466.

Use of Li to demonstrate possibility of concentrating isotopes by ion-exchange reactions. 5 ref.

**10936 X-Ray Absorption Spectra of Ni, Cu, and Zn Ions in Aqueous and Nonaqueous Solutions.** E. Ye. Vainshtein and V. S. Kavetsky. *National Science Foundation Translation, no.* 141, Dec. 1953, 4 p. (From *Doklady Akademii Nauk SSSR*, v. 91, 1953, p. 775-778.)

Spectra of Zn dissolved in form of salts in acetone, pyridine, water, ethyl and methyl alcohols, and glycerine; Cu dissolved in gylcol, water, methyl alcohol, and gylcerine; and Ni in solutions of glycol, water, and ethyl alcohol. Spectrograms, table, graph. 9 ref.

**10937 Photo- and Semi-Conductance in Molecular Single Crystals.** D. J. Carswell, J. Ferguson, and L. E. Lyons. *Nature*, v. 173, Apr. 17, 1954, p. 736.

Experimental results on anthracene-type crystals. Impurities, energy conversion, and transitions. 7 ref.

**10938* Radio-Active Exchange Studies on the Transformations of the Hydrates of $CaSO_4$.** (English.) J. A. A. Ketelaar and D. Heijmann. *Recueil des travaux chimiques des Pays-Bas*, v. 73, no. 4, Apr. 1954, p. 279-286.

Includes tables, graphs. 16 ref.

**10939*** (Surface-Active Materials. New Resources for the Engineer.) **Les tensio-actifs.** José de Launoit and Henry Jungels. *Revue universelle des mines*, v. 10, ser. 9, no. 4, Apr. 1954, p. 92-96.

Industrial application in fields of chemistry, coal, metallurgy, and machinery.

**10940 The Degradation of Solid Polymethylmethacrylate by Ionizing Radiation.** P. Alexander, A. Charlesby, and M. Ross. *Royal Society, Proceedings*, v. 223, ser. A, May 6, 1954, p. 392-404.

Two reactions predominate: breakdown of the main chain and decomposition of side chain with evolution of gases. Viscosity measurements offer a possible means of measuring high-energy radiation doses. Graphs, table. 25 ref.

**10941* Particle Mechanics.** R. L. Brown and P. G. W. Hawksley. *Times Science Review*, 1954, Summer, p. 6, 8-9.

Characteristics and behavior of small particles understood when size-distribution determinations are placed on a firm basis. Photographs, diagrams. 6 ref.

**10942*** (Model Equipment on the Continuous Separation of Isotopes.) **Modellversuch zur kontinuierlichen Isotopentrennung.** J. Hengevoss and R. Fleischmann. *Zeitschrift für Physik*, v. 137, no. 3, Apr. 14, 1954, p. 265-273.

Design and operation of cylindrical separating tube. N concentration measured by flow rate. Diagrams, graphs. 5 ref.

**10943* Theory of Supersaturated Solutions.** (Russian.) E. I. Akhumov and B. Ia. Rozen. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 12, Dec. 1953, p. 1760-1766.

Supersaturation depends on temperature, supercooling on concentration. Graphs, tables. 19 ref.

**10944* Determining Coefficients of Ion Diffusion In Molten Salts.** (Russian.) Iu. K. Delimarskii, B. F. Markov, and L. S. Berenblium. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 12, Dec. 1953, p. 1848-1855.

Based on measurement of current drop with time on the flat electrode. Diagrams, graphs, tables, photographs. 8 ref.

**10945* Thermochemistry of Certain Iodide Complexes.** (Russian.) K. B. Iatsimirskii and A. A. Shutov. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 1, Jan. 1954, p. 30-35.

Change in heat content and entropy during complex ion formation. Tables. 6 ref.

**10946* Formation of Complex Silver Bromides in Solutions.** (Russian.) K. S. Lialikov and V. N. Piskunova. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 1, Jan. 1954, p. 127-134.

Activity coefficients and equilibrium constants. Tables, graphs. 5 ref.

**10947* Adsorptive Activity of the Catalase Function of Copper and Iron Ions and Their Complex Compounds.** (Russian.) L. A. Nikolaev. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 2, Feb. 1954, p. 275-281.

Includes tables, graphs. 5 ref.

**10948*** (Volumetric Effects of Changing Electrolytes Into an Amorphous Form During Their Dissolution in Water.) **Ob obemnykh effektakh amorfizatsii pri rastvorenii v vode elektrolitov.** A. P. Rutskov. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 3, Mar. 1954, p. 402-413.

Approximated numercial values of volumetric magnitudes for 96 electrolytes and 34 individual ions. Tables. 22 ref.

**10949*** (Role of Contact Oxygen in the Course of Catalytic Oxidation of CO.) **O roli kisloroda kontakta v protsesse kataliticheskogo okisleniia CO.** F. M. Vainshtein and G. Ia. Turovskii. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 3, Mar. 1954, p. 556-557.

Critical investigation of several works. 10 ref.

**10950* Distribution of Isomorphic and Isodimorphic Components Between Solid and Liquid Phases During Crystallization Out of Aqueous Solutions. III. Equilibrium in the System $Co(NO_3)_2$-$Ni(NO_3)_2$-$H_2O$ at 20 C.** (Russian.) G. I. Goeshtein and N. I. Silant'eva. *Zhurnal Obshchei Khimii*, v. 24, no. 2, Feb. 1954, p. 201-203.

Includes table, graphs. 3 ref.

**10951* Cracking of Normal Paraffin Hydrocarbons in Presence of Aluminum Chloride. I. Cracking of *n*-Heptane and *n*-Nonane.** (Russian.) L. A. Potolouskii and G. S. Spektor. *Zhurnal Obshchei Khimii*, v. 24, no. 2, Feb. 1954, p. 225-231.

Includes tables, diagrams. 19 ref.

**10952* Interaction of Solid Substances Without Direct Contact.** (Russian.) M. E. Pozin, A. M. Ginstling, and V. V. Pechkovskii. *Zhurnal Prikladnoi Khimii*, v. 27, no. 3, Mar. 1954, p. 273-279.

Role of gaseous phase in solid-state reactions. Tables, graphs, photographs. 14 ref.

**10953*** (Oxidation of Sulfur Dioxide on Vanadium Catalyst in a Suspended State.) **Okislenie sernistogo gaza na vanadievom katalizatore vo vzveshennomsostoianii.** M. L. Varlamov. *Zhurnal Prikladnoi Khimii*, v. 27, no. 4, Apr. 1954, p. 360-367.

Effect of particle size. Tables, graph. 9 ref.

**10954*** (Role of Gaseous Phase in Reaction Between Solid Substances.) **O poli gazovoi fazy v reaktsiiakh mezhdu tverdymi veshchestvami.** M. E. Pozin, A. M. Ginstling, and V. V. Pechkovskii. *Zhurnal Prikladnoi Khimii*, v. 27, no. 4, Apr. 1954, p. 376-381.

Pressure and temperature effect on reaction rate. Tables, graph. 5 ref.

*See also:*
**10752** (interaction in molten salts)
**10753** (interaction in molten salts)
**10857** (isotope C exchange)
**10900** (catalytic action of titanic acid)
**11298** ($N_2$ adsorption in NaCl)
**11593** (compressibilities of glucose)
**11728** (adsorption of $H_2$ by Pd-Ag alloys)
**11752** (oxidation by charged particle radiations)
**12030** (continuous preparation of silica sols)

## COATINGS

**10955* Annual Review of Literature on Fats, Oils, and Soaps. I. Report of the Literature Review Committee.** M. M. Piskur. *American Oil Chemists' Society, Journal*, v. 31, May 1954, p. 176-191.

Non-critical review of data made available in 1953. Table.

**10956* Inter- and Intra-molecular Polymerization in Heat-Bodied Linseed Oil.** R. F. Paschke and D. H. Wheeler. *American Oil Chemists' Society, Journal*, v. 31, May 1954, p. 208-211.

Polymeric glycerides separated from monomeric glycerides; derived methyl esters of each fraction analyzed for monomer, dimer, and trimer. Tables. 21 ref.

**10957 Methods of Dispersion.** J. E. Thornton. *American Paint Journal*, v. 38, May 3, 1954, p. 61 + 9 pages.

Separation of paint pigment particles, replacement of film of adsorbed air on particle with a film of liquid, and even distribution of particles throughout liquid phase of system. Graphs, photographs. 10 ref.

**10958 Fundamentals of Paint, Varnish and Lacquer Technology. Chap. X. The Clear Oleoresinous Finish. II.** Elias Singer. *American Paint Journal*, v. 38, May 10, 1954, p. 74 + 5 pages.

Formulation of specific types of clear finishes including floor and furniture varnishes and shellac. (To be continued.)

**10959 Polyvinyl Acetate as a Paint Vehicle.** R. J. Davis. *American Paint Journal*, v. 38, May 24, 1954, p. 78, 80, 82.

Availability and reduced price renew interest in polyvinyl for paint use.

**10960 Clear Finishes for Exteriors of Houses.** F. L. Browne. *American Paint Journal*, v. 38, May 24, 1954, p. 88 + 7 pages.

6 ref.

**10961 Porcelain Enameled Aluminum, a Competitive Product. II.** D. R. Goetchius. *Ceramic Industry*, v. 62, May 1954, p. 72-73, 103.

Enameling processes; details of costs as compared with enameling on steel; and relative merits as a competitive item. Photographs.

**10962 Internal Coating of Pipe in Place.** M. B. Grove. *Corrosion*, v. 10, May 1954, p. 142-146.

Procedures and results of plastic coating inside of old Al, steel, and new steel pipe *in situ*. Diagram.

**10963 Weld Seam and Weld Flux Effect on Metal Surface and Coating Life.** A. J. Liebman. *Corrosion*, v. 10, May 1954, p. 147-150.

Alkaline and hygroscopic welding flux by-products, deposited on weld seam and adjacent areas, frequently cause early failure of coatings. Photographs. 1 ref.

**10964 Theory and Practice of Chemical Polishing. III. The Theory of Chemical Polishing.** R. Pinner. *Electroplating and Metal Finishing*, v. 7, 1954, p. 127-131, 140.

Theory of metal dissolution in acid solution. Various types of film growth and their importance in suppressing etch-attack. Graphs. 13 ref.

**10965*** (Status of Varnish and Paint Techniques in the Field of Protection Against Corrosion.) **Stand der Lack- und Anstrichtechnik auf dem Gebiet des Korrosionsschutzes.**

## *Coatings*

G. Sprock. *Fette, Seifen, Anstrichmittel*, v. 56, no. 4, Apr. 1954, p. 238-241.

Protective effects; compositions; properties of basic raw materials. Tables.

**10966 One-Coat White Enamel.** J. Semple. *Foundry Trade Journal*, v. 96, May 6, 1954, p. 533-537.

Characteristics and composition of material. Effect of superopaque enamels in plant and material utilization. Graphs.

**10967* Low Temperature Enamels and Their Application to Aluminum.** *Industrial Finishing (London)*, v. 6, Apr. 1954, p. 630-634.

Advantages of various compositions. Conditions to be satisfied in preparation. 21 ref.

**10968* Sealing Metal Surfaces With Resins.** A. E. Williams. *Industrial Finishing (London)*, v. 6, Apr. 1954, p. 635-641.

Ethoxyline resins offer good surface protection for Mg, Al, bronze, and ferrous metals. Photographs, tables.

**10969 Better Properties Extend Uses for Porcelain Enamels.** W. A. Barrows. *Iron Age*, v. 173, May 13, 1954, p. 121-124.

Problems involving heat, corrosion, thermal shock, and other service conditions are being solved. On cold-rolled steel, coatings stand repeated shocking from 1000 to 60 F. Industrial enamels resist sulfuric and muriatic acids. Photographs, table.

**10970 Plating Setup Recycles Propellers for Proper Balance.** C. B. Conwell and C. J. Stansfield. *Iron Age*, v. 173, May 20, 1954, p. 133-135.

New Zn-plating installation speeds operation 30 to 50%; deposits are most consistent. Photographs, diagram.

**10971 The Fluorine and Chromium Contents of Treated Aluminium Surfaces.** R. Holt. *Journal of the Science of Food and Agriculture*, v. 5, Apr. 1954, p. 173-176.

Lacquered cans made from Alocrom treated Al would not be dangerous to health. Tables. 6 ref.

**10972 Sprayed Metals.** D. A. Watson. *Machine Design*, v. 26, May 1954, p. 166-170.

Basic characteristics of present-day process; end results to be expected. Photographs, tables.

**10973 Precious-Metal Laminates.** W. Channing and G. H. Barney. *Machine Design*, v. 26, May 1954, p. 180-183.

Types, applications, and properties. Photographs, table.

**10974*** (Infra-Red Lacquer Drying.) **Infravörös lakkszárítás.** Péter Pál Takács. *Magyar Kémikusok Lapja*, v. 9, no. 4, Apr. 25, 1954, p. 122-124.

Theory, practice, and problems of introducing process on industrial basis in Hungary. Graphs, diagram. 2 ref.

**10975*** (Further Development of Metal Spraying Technique.) **Weiterentwicklung der Metallspritz-technik.** Hans Reininger. *Metalloberfläche*, Ausgabe B, v. 6, no. 5, May 1954, p. 73-75.

A review on effects of oxides in structure of coatings. Tables, micrographs. 23 ref.

**10976 The Efficiency of Some Protective Treatments in Preventing the Oxidation of Mild Steel at High Temperatures.** A. H. Sully, E. A. Brandes, and R. H. Brown. *Metallurgia*, v. 49, no. 294, Apr. 1954, p. 165-168.

Effectiveness of chromizing, Al coating, or enameling steel to protect it against oxidation when heated to 700 C for 1,000 hr. Tables, graphs. 2 ref.

**10977 The Effect of Chromate Films on the Corrosion Resistance of Hot Dip Galvanize in Brine.** Frank J. Bubsey. *Metal Progress*, v. 65, May 1954, p. 122-124.

Beneficial lowering of corrosion. Method is simple and cheap. Graphs, table, photograph.

**10978 Some Applications of Statistical Methods to Exposure Trials. II. Design of Exposure Tests.** H. R. Touchin. *Oil & Colour Chemists' Association, Journal*, v. 37, May 1954, p. 248-260; disc., p. 261-263.

Simpler, more common aspects of experimental design; application to exposure trials. Tables. 15 ref.

**10979 Impermeable Organic Coatings.** F. S. Stewart. *Organic Finishing*, v. 15, May 1954, p. 8-10.

Mechanism of drying; indications of impermeability; and chemical resistance of certain single layer films. Graph, photographs.

**10980 Appearance Measurements. III. Color.** Edward S. Beck. *Organic Finishing*, v. 15, May 1954, p. 19-25.

Color measuring devices. Graphs, photographs, diagrams.

**10981* The Styrenation of Alkyd Resins.** A. R. Hempel. *Paint Industry Magazine*, v. 69, May 1954, p. 21-23, 36.

New surface coatings made from easily converted alkyd resin. Graphs.

**10982 Pentaerythritol Drying Oils as Paint Media.** S. Gourley. *Paint Manufacture*, v. 24, May 1954, p. 147-148, 157.

Change from glycerol to pentaerythritol esters in fatty oils leads to faster polymerization, harder films, and better outside durability. Tables. 1 ref.

**10983* Clear and Pigmented Lacquers. I-II.** E. H. Miller. *Paint, Oil & Chemical Review*, v. 117, May 6, 1954, p. 18-21, 30-32; May 20, 1954, p. 15 + 14 pages.

Properties and advantages of cellulose esters; vinyl, acrylic, and polyamide resins; soluble nylon; silicones; and others. Tables, graphs. 24 ref.

**10984* Effect of Lecithin on the Dispersion of Titanium Dioxide in Latex Paints.** Max Kronstein. *Paint and Varnish Production*, v. 44, May 1954, p. 21-27, 76.

Increases speed of pigment dispersion, causing viscosity of paint to reach a particular level faster. Tables, graphs. 6 ref.

**10985* Zirconium Metal as a Drier Catalyst.** George W. Gregg. *Paint Industry Magazine*, v. 69, Apr. 1954, p. 17-19.

Applications for protective coatings industry.

**10986*** (Enamelling of Light Metals With Vitrified Enamel.) **L'émaillage des métaux légers par les émaux vitrifies. II.** F.-J. Biechler, J.-J. Meynis de Paulin. *Revue de l'Aluminium*, v. 31, no. 209, Apr. 1954, p. 135-318.

Preparation of metal and enamel; cause of defects. 4 ref.

**10987* Experimental Investigation in Metal Spraying.** (German.) A. Matting and K. Becker. *Schweissen und Schneiden*, v. 6, no. 4, Apr. 1954, p. 127-142.

Photographic study of process within the nozzle. Table, photographs, graphs, diagrams. 57 ref.

**10988 Continuous Strip Galvanizing in Argentina.** C. R. W. Hughes. *Sheet Metal Industries*, v. 31, no. 325, May 1954, p. 359-366.

Modernization effected; operation of plant. Photographs.

**10989*** (The Application of Enamel.) **Das Auftragen von Emails.** Rudolf Maraker. *Silikat Technik*, v. 5, no. 3, Mar. 1954, p. 136-138.

Application on different types of ware. Table. 2 ref.

**10990* Protective Lead Paint Coating.** (German.) Oscar Neuss. *Werkstoffe und Korrosion*, v. 5, no. 4, Apr. 1954, p. 139-140.

Weathering tests substantiate protective value compared with oil-base paints.

**10991* Investigation of Certain Liquid Greases for Protection of Steel During Use and Storage.** (Russian.) V. V. Skorchelletti and V. E. Piskorskii. *Zhurnal Prikladnoi Khimii*, v. 27, no. 3, Mar. 1954, p. 314-318.

Addition of montan wax gave best results. Graphs, tables. 5 ref.

*See also:*
**10711** (coatings for glass containers)
**10725** (silicone water repellant coatings)
**11013** (protective coatings for Al)
**11172** (paint production costs)
**11417** (directory of coatings and finishes)
**11600** (magnetic susceptibility of metal coatings)
**11912** (high ploymers in coatings)
**11978** (surface-active agents in textiles)
**12015** (hard facing with Mn-steel electrodes)

## CORROSION

**10992* Mechanism of Corrosion Inhibition by Sodium Metaphosphate Glass.** James C. Lamb, III and Rolf Eliassen. *American Water Works Association, Journal,* v. 46, May 1954, p. 445-460.

Effects of corrosion products in water; theory of film deposition. Diagrams, graphs, table. 19 ref.

**10993* Cathodic Protection. I.** L. L. Shreir. *Chemical & Process Engineering,* v. 35; *Corrosion Technology,* v. 1, May 1954, p. 63-65, 78.

Principles; applications; advantages and limitations; and uses. Graphs, diagram, photographs. 16 ref.

**10994* Research Laboratories Tackle Corrosion Problems.** *Chemical & Process Engineering,* v. 35; *Corrosion Technology,* v. 1, May 1954, p. 77-78.

Summary of results achieved; future plans recorded in 1952-53 D.S.I.R. report.

**10995 A Comparison of Chemical and Electrolytic Methods of Reduction.** M. G. Fouad and J. F. Herringshaw. *Chemical Society, Journal,* 1954, Apr., p. 1207-1212.

Relation between reduction by dissolving metals and electrolytic reduction. Rate of former process predicted from electrolytic reduction data. Tables.

**10996 Corrosion and Its Control in Aluminum Cooling Towers.** Sidney Sussman and J. Akers. *Corrosion,* v. 10, May 1954, p. 151-159.

Six commercial Al compositions were tested in the field Serious pitting occurred with untreated and improperly treated circulating waters. Photographs, tables. 1 ref.

**10997 Inspection of Petroleum Refinery Equipment.** Edward H. Tandy. *Corrosion,* v. 10, May 1954, p. 160-163; disc., p. 163-164.

Conditions created by corrosive compounds in crude oils; formation of corrosive compounds during processing; and use of corrosive process chemicals requires constant inspection of equipment. Diagram, graph, photograph.

**10998 Cathodic Protection in Florida Power and Light Company's Generating Plants.** Joseph B. Prime, Jr. *Corrosion,* v. 10, May 1954, p. 165-168.

Cathodic protection of intake structures and sea water cooled condensers proved practical and economical during the past 5 years. Diagrams, table.

**10999*** (Corrosion of Metals by Saturated Fuel.) **Korroziia metallov predel'nym toplivom.** I. N. Putilova, L. G. Gindin, and E. V. Artamonova. *Doklady Akademii Nauk SSSR,* v. 94, no. 3, Jan. 21, 1954, p. 489-492.

Effect of kerosene on C and low-alloy steels; and Mg and its alloys. Tables. 9 ref.

**11000*** (Oxidation of Iron in Air at High Temperatures.) **Okislenie zheleza v vozdukhe pri vysokikh temperaturakh.** V. V. Ipat'ev and V. I. Tikhomirov. *Doklady Akademii Nauk SSSR,* v. 94, no. 3, Jan. 21, 1954, p. 505-508.

Rate of oxidation, composition, and structure of scale produced during oxidation of Armco Fe at high temperatures in dry and moist atmospheres. Diagram, graphs, photograph. 15 ref.

**11001*** (Passivity of Iron in Concentrated Sulfuric Acid.) **O Passivnosti zheleza v konstentrirovannoi sernoi kislote.** V. M. Novakovskii and A. I. Levin. *Doklady Akademii Nauk SSSR,* v. 94, no. 6, Feb. 21, 1954, p. 1113-1116.

Formula determines corrosion rate during oxidation of clean Fe and corrosion of Fe covered by $Fe_2(SO_4)_3$. Graphs. 6 ref.

**11002*** (Composition of Photographically Active Particles Separated by Metals During Atmospheric Corrosion.) **O Sostave fotograficheski aktivnykh chastits vydeliaemykh metallami pri atmosfernoi korrozii.** I. L. Roikh. *Doklady Akademii Nauk SSSR,* v. 94, no. 6. Feb. 21, 1954, p. 1117-1120.

Photographic effect results in separation of particles having ability to form a concealed image. Graphs. 8 ref.

**11003* Resistance of Metals to Cavitation Corrosion in Fresh and Sea Water.** (Russian.) K. K. Shal'nev. *Doklady Akademii Nauk SSSR,* v. 95, no. 2, Mar. 11, 1954, p. 229-232.

Investigations on brass, bronze, and grey cast iron show mechanism is different from that formerly assumed. Graph, table, micrographs, diagrams. 14 ref.

**11004* Oxidation of Iron in Water Vapor, Vapor-Hydrogen, and Vapor-Oxygen Mixtures at High Temperatures.** (Russian.) V. I. Tikhomirov, V. V. Ipat'ev, and I. A. Gofman. *Doklady Akademii Nauk SSSR,* v. 95, no. 2, Mar. 11, 1954, p. 305-308.

Theoretical investigation closely corresponds to experimental results. Tables, graphs.

**11005* Inhibitors of Atmospheric Corrosion.** (Russian.) S. A. Balezin and V. P. Barannik. *Doklady Akademii Nauk SSSR,* v. 95, no. 2, Mar. 11, 1954, p. 345-347.

Carbonates and benzoates showed good inhibition properties on carbon steel. Table, micrographs. 4 ref.

**11006 Potentials of Iron, 18-8, and Titanium in Passivating Solutions.** Herbert H. Uhlig and Arthur Geary. *Electrochemical Society, Journal,* v. 101, May 1954, p. 215-224.

Includes data for stainless steel and Ti in passivating electrolytes. Graphs, tables. 47 ref.

**11007* Eight Uses for Insulating Joints.** A. W. Peabody. *Gas Age,* v. 113, May 6, 1954, p. 25-30, 75-81.

Corrosion protection in gas distribution. Diagrams.

**11008 Mechanism of Filiform Corrosion.** W. H. Slabaugh and Morris Grotheer. *Industrial and Engineering Chemistry,* v. 46, May 1954, p. 1014-1016.

Workable theory and control by considering postulates basic to mechanism. Photographs, table, diagrams. 5 ref.

**11009 Corrosion.** Mars G. Fontana. *Industrial and Engineering Chemistry,* v. 46, May 1954, p. 85A-86A, 88A.

Al-Fe alloys with and without Mo show excellent oxidation resistance and low corrosion by some aqueous solutions. Tables, graph, photograph.

**11010 The Influence of Extrusion Direction on the Corrosion and Stress-Corrosion of Aluminium-Copper-Magnesium Alloys.** E. A. G. Liddiard and Winifred A. Bell. *Institute of Metals, Journal,* v. 82, May 1954, p. 426-432 + 1 plate.

In fully heat-treated condition, extrusions show little susceptibility to stress-corrosion when stress is parallel with direction of extrusion. Tables, micrographs, photograph. 3 ref.

**11011 Low Carbon Stainless Resists Intergranular Corrosion.** R. E. Paret. *Iron Age,* v. 173, May 6, 1954, p. 132-134.

Carbide formation in lower C grades occurs so slowly that normal welding and stress-relieving temperatures have no noticeable effect on corrosion resistance. Tables, photograph.

**11012 Electrical Measurements in the Selection of Bolt Materials for Service Underground.** W. J. Schwerdtfeger. *Journal of Research, National Bureau of Standards,* v. 52, May 1954, p. 265-274.

Effect of exposure on potentials of cast iron and galvanized iron as components of galvanic couples. Graphs, tables, photographs. 15 ref.

## *Corrosion*

**11013* Surface Treatment and Finishing of Light Metals. II. Corrosion and Protection of Aluminum.** S. Wernick and R. Pinner. *Metal Finishing*, v. 52, May 1954, p. 71-77.

Protection by metal spraying and oxide films. Properties of various coatings. Tables, photograph. 68 ref.

**11014*** (Theoretical and Experimental Study of Some Phenomena of Dezincification in Brasses.) **Studio teorico e sperimentale su alcuni fenomeni di dezincificazione negli ottoni. II.** (Means of Preventing Dezincification Phenomena.) **Mezzi per prevenire i fenomeni di dezincificazione.** Paolo Lombardi. *Metallurgia italiana*, v. 46, no. 3, Mar. 1954, p. 91-96.

Effect of addition elements. Graphs, table. (To be continued.)

**11015 Effect of Local-Action Currents on the Iron Potential.** Herbert H. Uhlig. *National Academy of Sciences of the United States of America, Proceedings*, v. 40, May 1954, p. 276-285.

Dependence of corrosion potential on corrosion rate. Change of rate with pH. Graph. 16 ref.

**11016* Simple Corrosion Theory as an Aid to Materials Selection. II.** T. K. Ross. *Petroleum*, v. 17, May 1954, p. 154-155, 184.

Differences in polarity about a metal surface may produce attack in seemingly innocuous and nearly neutral conditions. Various examples. Table, graph, diagram.

**11017 Measuring Plant Corrosion Costs.** V. B. Guthrie. *Petroleum Processing*, v. 9, May 1954, p. 708-709.

New technique analyzes costs proposed by cost study group. Table.

**11017a* Stray Currents From Cathodic Protection Installations.** C. A. Erickson. *Pipe Line News*, v. 26, May 1954, p. 39, 42-45.

**11018* Comparative Analysis of Digester Corrosion Measurements. TAPPI Digester Corrosion Subcommittee Summary Report No. 1.** Nicholas Shoumatoff and H. O. Teeple. *Tappi*, v. 37, Apr. 1954, p. 166-171.

Industry-wide study of corrosion in alkaline digesters by numerical analysis of over 37,000 wall thickness measurements in 89 digesters in 12 different mills. Tables, graph. 12 ref.

**11019* Comparative Analysis of Digester Corrosion Measurements.** A. Ungar and T. E. Caywood. *Tappi*, v. 37, May 1954, p. 177-190.

Bulk of data supplied by alkaline pulp mills; analysis has concentrated on these. Tables, graphs. 15 ref.

**11020* The Dissolution of Various Metals When in Contact With Rotating Platinum Electrodes.** (German.) Tihomil Markovic. *Werkstoffe und Korrosion*, v. 5, no. 4, Apr. 1954, p. 121-123.

Influence of cathode surface on rate of corrosion. Results indicate definite distribution of cathodic and anodic spots. Graphs, table.

**11021* Electrode Potentials and Corrosion of Molybdenum and Tungsten.** (Russian.) A. Ia. Shatalov and I. A. Marshakov. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 1, Jan. 1954, p. 42-50.

Measurement in buffer solutions with varied $Cl^-$ content. Graphs, tables. 19 ref.

**11022*** (Dependence of Iron Corrosion Velocity on the pH of KCl Salt Solution.) **O zavisimosti skorosti korrozii zheleza ot pH rastvora soli (KCl).** L. K. Lepin' and A. Ia. Vaivade. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 3, Mar. 1954, p. 435-439.

Experiments with pH values from 3 to 9. Table, graph. 10 ref.

**11023*** (Oxidation of Iron and Steel at High Temperatures.) **Okislenie zheleza i stali pri vysokikh temperaturakh.** N. P. Zhuk and B. V. Linchevskii. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 3, Mar. 1954, p. 440-452.

Kinetics of oxidation from 400 to 1100 C. Diagram, tables, graphs. 30 ref.

**11024*** (Action of Molten Chlorides of Lithium, Sodium, Potassium on Nickel, Copper, and Certain Steels.) **Deistvie rasplavlennykh khloridov litiia, natriia i kaliia na nikel, med i nekotorye stali.** E. I. Gurovich. *Zhurnal Prikladnoi Khimii*, v. 27, no. 4, Apr. 1954, p. 425-432.

Corrosion rates and passivation. Graphs, tables, diagram. 8 ref.

**11025*** (Investigation of Thin Coatings of Protective Greases for Preservation of Steel Objects.) **Issledovanie tonkosloinykh smazok dlia khraneniia stal'nykh izdelii.** V. V. Skorchelletti, A. I. Bukhbinder, and V. E. Piskorskii. *Zhurnal Prikladnoi Khimii*, v. 27, no. 4, Apr. 1954, p. 454-456.

Effectiveness of grease containing Al oleate. Tables. 1 ref.

**11026*** (Influence of Surface-Active Substances on Corrosion of Cathodic Zinc.) **Vliianie poverkhnostno-aktivnykh veshchestv na korroziiu katodnogo tsinka.** V. S. Kolevatova and A. I. Levin. *Zhurnal Prikladnoi Khimii*, v. 27, no. 4, Apr. 1954, p. 456-460.

Detrimental action of Ni, Cu, Sb, and Co removed by additions of glue, $\beta$-naphthol, and soaproot. Diagram, micrographs, tables. 7 ref.

***See also:***
**10775** (scale in sugar refining equipment)
**10977** (corrosion of galvanized steel)
**11173** (cathodic protection of pipelines)
**11272** (corrosion of boilers)
**11343** (rust inhibitors)
**11735** (oxidation rates of Fe powder)

## ELECTRICAL ENGINEERING

**11027* Considerations in Applying Rectifiers as a Power Supply for Hot Strip Mills.** G. M. Zins and E. J. Cham. *Applications and Industry*, 1954, no. 12, p. 65-69; disc., p. 69-70.

Use of ignitrons results in higher efficiency and lower initial and maintenance costs. Diagrams, photograph, oscillogram, graph. 3 ref.

**11028* Fundamentals of Flashing of Diesel-Electric Motors and Generators.** C. A. Atwell. *Applications and Industry*, 1954, no. 12, p. 70-76; disc., p. 76-77.

Causes of flashing from design and operating standpoints. Diagrams, oscillograms, graph, photograph. 10 ref.

**11029*** (Selective Special Amplifier for a Frequency of 6.25 Cycles Per Sec.) **Selektiver Spezialverstärker für eine Frequenz von 6,25 Hz.** K. Bauer and W. Haberditz. *Archiv für technisches Messen*, 1954, no. 219, Apr., p. 89-92.

A highly sensitive, selective service amplifier. Diagrams, photographs, graph.

**11030*** (Use of Mechanical Systems and Selenium Cells.) **Gebruik van mechanische systemen en seleniumcellen.** L. v. Viddeleer. *Bedrijf en Techniek*, v. 9, no. 195; *Electronica section*, v. 7, no. 142, Feb. 13, 1954, p. 25-27.

Use in protecting sensitive current meters in case of short-circuits. Graphs, diagram.

**11031*** (Measuring of Frequencies at High Voltages.) **Meten van frequentietoerentallen en hoge spanningen.** *Bedrijf en Techniek*, v. 9, no. 200; *Electronica section*, v. 7, no. 147, Apr. 24, 1954, p. 65-67.

Instrument measures voltage of sources with very low capacity; theoretical basis; practical application. Diagrams, photographs.

**11032 The Growth of the Liquid Bridge in an Electrical Contact.** P. M. Davidson. *British Journal of Applied Physics*, v. 5, May 1954, p. 189-191.

Mathematical procedure calculates progressive changes in shape, size, and temperature distribution of a molten contact-bridge, from initial stage to stage at which bridge breaks. Diagrams. 5 ref.

**11033* Electrical Problems Aboard Submarines.** George E. Saunders. *Bureau of Ships Journal*, v. 3, May 1954, p. 15-19.

System and equipment design; installation; and maintenance. Diagrams, photographs.

**11034* Eddy-Current Losses in a Semi-Infinite Solid Due to a Nearby Alternating Current.** H. Poritsky and R. P. Jerrard. *Communication and Electronics,* 1954, May, p. 97-106.

Losses in parts where lamination is not possible. Includes motors, steel buildings, and power and telephone lines. Table, graphs. 7 ref.

**11035* An Automatic Voltage Control System for Electrical Precipitators.** H. J. Hall. *Communication and Electronics,* 1954, May, p. 124-127.

Performance is reflected in increased long-term collection efficiency and reduced operating expense. Photographs, diagram, graphs. 8 ref.

**11036* Application of Network Theory to the Analysis of Rotating Machinery. I. Synchronous and Asynchronous Machines. II. Commutating Machines.** H. E. Koenig. *Communication and Electronics,* 1954, May, p. 162-174; disc., p. 174-177.

Correlation of various design problems to one common theory. Table, diagrams. 10 ref.

**11037* Digital Computers as an Aid in Electric-Machine Design.** R. M. Saunders. *Communication and Electronics,* 1954, May, p. 189-191; disc., p. 191-192.

Speed in successive design calculations is major advantage. Engineer is released for more productive work. Tables. 3 ref.

**11038* Study of Priming of Electric Discharge Without Electrodes in Neon and Xenon.** (French.) Francois Cabannes. *Comptes rendus,* v. 238, no. 14, Apr. 5, 1954, p. 1482-1484.

Magnitude of inductive electric field. Graph. 5 ref.

**11039* Dielectric Losses in Aluminum Oxide.** (Russian.) N. P. Bogoroditskii and N. L. Poliakova. *Doklady Akademii Nauk SSSR,* v. 95, no. 2, Mar. 11, 1954, p. 257-259.

Experimental investigation of $\alpha$, $\beta$, and $\gamma$ modifications of $Al_2O_3$. Tables. 4 ref.

**11040 Designing Automatic Equipment for Servicing.** N. P. Bashor. *Electrical Manufacturing,* v. 53, May 1954, p. 102-107.

Wired-in wiring diagrams, control monitors, positive end-point timing, and mechanical data transfer extend life and speed servicing of shell-machining equipment. Photographs, diagrams.

**11041 Combined JIC-NMTBA Electrical Standards.** *Electrical Manufacturing,* v. 53, May 1954, p. 111-125.

Joint Industry Conference Electrical Standards for Industrial Equipment, revised and adopted Mar. 1953 and the National Machine Tool Builders' Association Electrical Standards revised and adopted Jan. 1954. Diagrams.

**11042 Dielectric Strength of Solid Insulation.** J. J. Chapman and L. J. Frisco. *Electrical Manufacturing,* v. 53, May 1954, p. 136-143.

Investigates 22 materials, both ceramic and plastic, from 60 cycles to 100 mc. Test methods and apparatus. Tables, graphs, diagrams. 4 ref.

**11043* Trends in Distribution for Rural and Residential Areas.** *Electrical World,* v. 141, May 17, 1954, p. 133-143.

Primary voltage moves toward 12 kv.; bigger sub-stations use higher voltage supply; more primary circuits require cable; expansion policy features reliability; and pole transformers and secondaries grow larger. Tables. 51 ref.

**11044* Service Reliability Standards Aid Planning and Operation.** W. J. Lyman and V. E. Hill. *Electrical World,* v. 141, May 17, 1954, p. 150-151.

Outstanding advantage is elimination of confusion and controversy about how distribution sub-stations and industrial customers should be served. Tables.

**11045* Load-Structure of a Modern Electric Utility System.** Constantine W. Bary. *Electric Light and Power,* v. 32, May 1954, p. 85-89.

Establishment of a conceptional model is essential step in conducting systematic research on probable behavior of elements comprising each class of load. Graphs, diagrams. 1 ref.

**11046* Norwegian Research Provides Data for Grounding in Difficult Terrain. III. Lightning Influence and Conclusions.** Th. Bedmar. *Electric Light and Power,* v. 32, May 1954, p. 102-107.

Theoretical investigations and experimental tests in a variety of soils and with all types of electrodes. Graphs, diagram. 17 ref.

**11047*** (Effect of Ionic Impulse Excitation in Increasing Dynamic Stability of Long Electrical Transmission Lines.) **Ob effektivnosti ionnogo udarnogo vozduzhdeniia v povyshenii dinamicheskoi ustoichivosti dal'nikh elektrperedach.** D. E. Trofimenko. *Elektrichestvo,* 1954, no. 1, Jan., p. 12-14.

Comparison with mechanical excitation shows no appreciable effects. Tables, graphs.

**11048*** (Influence of 400 Kv. Electric Transmission Lines on High Frequency Telephone Communication Channels.) **Vliianie vysokochastotnykh kanalov linii elektroperedachi 400 kv na vysokochastotnye telefonnye kanaly.** L. E. Pavlychev. *Elektrichestvo,* 1954, no. 1, Jan., p. 26-34.

Phenomena of two lines under varying degrees of proximity. Diagrams, graphs, table. 3 ref.

**11049*** Improving the Method of Calculating the No-Load Characteristics of Salient-Pole Synchronous Machines.) **Utochnenie metoda rascheta kharakteristik kholostogo khoda iavnopoliusnykh sinkhronnykh mashii.** A. N. Martynov. *Elektrichestvo,* 1954, no. 1, Jan., p. 34-41.

Amplitudes of basic and third harmonics of a field and overall magnetic flux depending on saturation. Graphs, table. 6 ref.

**11050* Complex Substitution Circuits for the Calculation of Transmission Processes by the Method of Symmetrical Components.** (Russian.) G. I. Atabekov and L. G. Mamikoniants. *Elektrichestvo,* 1954, no. 2, Feb., p. 52-54.

Concise review. Diagrams. 5 ref.

**11051* Fundamental Problems in Planning Regional Substations for Three Voltages.** (Russian.) E. A. Bugrinov. *Elektrichestvo,* 1954, no. 3, Mar., p. 30-33.

Scheme of electric connections to provide 110, 35, and 6 kv. Space requirements and equipment arrangement. Diagrams, table.

**11052* Reversed Field Braking Characteristics.** (Russian.) I. N. Serdinova and M. R. Barskii. *Elektrichestvo,* 1954, no. 3, Mar., p. 44-48.

Graphic method of calculating electric brake potentials is rapid and accurate. Graphs, tables, diagram. 1 ref.

**11053*** (Influence of Certain Forms of Local Load on Stability of Long Distance Electric Transmission.) **Vliianie nekotorykh vidov mestnoi magruzki na ustoichivosť dal'nikh elektroperedach.** I. A. Fedorova. *Elektrichestvo,* 1954, no. 4, Apr., p. 7-10.

Effect on static stability of Hg-arc rectifiers operating on counter-e.m.f. Tables, graphs. 5 ref.

**11054*** (Design of Frequency-Selective, Low-Frequency Amplifiers.) **K raschetu chastotno-izbiratel'nykh usilitelei nizkoi chastoty.** Iu. G. Kochinev. *Elektrichestvo,* 1954, no. 4, Apr., p. 56-59.

Application to double-T, frequency-selective RC circuits. Diagrams, graphs. 6 ref.

**11055*** (Development in Hungary of Prefabricated Ironclad Intermediate Voltage Switchgear.) **Elöregyártható tokozott (lemezborítású) középfeszültségú kapcsolóberendezések hazai kifejlesztése. I.** (General Technical Problems of the Development and Application of Prefabricated Ironclad Intermediate Voltage Switchgear.) **Az elöregyártható tokozott (lemezborítású) középfeszültségú kapcsolóberendezések fejlesztesenek es alkalmazasanak altalanos muszaki kerdesei.** Ference Ronkay. **II.** (Technological Problems of the Fabrication of Switch gears and the Development of the First Hungarian Ironclad Intermediate Voltage Switchgears.) **A kapcsoloberendezesek eloregytasanak es az elso, hazai lemezboritasu kozepfeszultsegu kapcsolocellak kifejlesztésének technológiai problemái.** Antal Kara and Lajos Hullai. *Elektrotechnika,* v. 47, no. 4, Apr. 1954, p. 98-115.

Includes diagrams, photographs. 25 ref.

## *Electrical Engineering*

**11056* Mechanical Current Rectifiers With Rolling Contacts. (Rolling Current Rectifiers.)** (German.) Erwin Marx. *Elektrotechnische Zeitschrift*, v. 75, Ausgabe A, no. 8, Apr. 11, 1954, p. 265-270.

Design of mechanical rectifier and circuit breaker. Advantages and limitations of inside and outside roll arrangements. Diagrams, graph. 8 ref.

**11057* Automatic Voltage Control of Synchronous Generators by Means of Grid-Controlled Rectifiers.** (German.) R. Modlinger. *Elektrotechnische Zeitschrift*, v. 75, Ausgabe A, no. 8, Apr. 11, 1954, p. 273-278.

Importance to stabilization of power from large hydro- and turbo-generators. Development of self-actuated high-power generator. Diagrams, oscillograms.

**11058* Trends in Development of Relays.** (German.) H. Franken. *Elektrotechnische Zeitschrift*, v. 6, Ausgabe B, no. 4, Apr. 21, 1954, p. 101-104.

Principles, design, advantages, and limitations of various relays. Diagrams, graphs, photographs. 9 ref.

**11059* Relays With Alternating- and Direct-Current Magnet.** (German.) E. Kündiger. *Elektrotechnische Zeitschrift*, v. 6, Ausgabe B, no. 4, Apr. 21, 1954, p. 105-109.

Effect of a.c. and d.c. on activation, life, and use of a relay. Diagrams, photographs, oscillograms.

**11060* High-Voltage Spark Discharges.** F. M. Bruce. *Endeavour*, v. 13, Apr. 1954, p. 61-71.

Experiments and theory on mechanism of electric spark in air. Graphs, table, photographs. 21 ref.

**11061* The Toronto Subway—Installation of Electrical Equipment.** J. Y. Doran. *Engineering Journal*, v. 37, Apr. 1954, p. 384-392.

Distribution of auxiliary a.c. power; lighting facilities for stations, tracks, yards, and shops. Photographs.

**11062* Modernization of NRC Impulse Testing Facilities.** F. C. Creed, N. L. Kusters, and W. J. Purvis. *Engineering Journal*, v. 37, Apr. 1954, p. 431-437.

Design and performance characteristics of 1,200 kv. generator. Diagrams, photographs.

**11063 Liquid Dielectrics.** A. H. Sharbaugh and R. W. Crowe. *General Electric Review*, v. 57, May 1954, p. 23-28.

Electrical properties are ability to resist breakdown, electric capacitance per unit volume, and loss factor. Graphs, diagrams, photograph.

**11064 Evaluating Electric Rotating Regulators.** G. E. Shaad. *Machine Design*, v. 26, May 1954, p. 299 + 5 pages.

Abridged from "Industrial Regulating Systems Using Rotating Regulators" presented at AIEE Winter Meeting, New York. Amplidyne and self-energized types are considered. Graph, diagrams.

**11065 The Thermistor.** L. Stockman. *Machinery Lloyd (Overseas Ed.)*, v. 26, Apr. 24, 1954, p. 103, 105-110.

Theory and application of sensitive control device. Graph, diagrams, photograph.

**11066 Molybdenum-Wound Electric Furnaces. Calculation of Winding Dimensions.** A. B. Ashton. *Metallurgia*, v. 49, no. 294, Apr. 1954, p. 191-194.

Factors involved; method of calculating. Graph. 1 ref.

**11067 More on Parallel Operation of A-C Generators.** H. A. De Bonneval. *Power Engineering*, v. 58, May 1954, p. 84-85.

How load variations affect a generator. Diagrams, graph.

**11068 Movable and Fixed Core Motion Transducers.** Albert E. Newton. *Product Engineering*, v. 25, May 1954, p. 170-173.

Developed for connecting into standard recording oscillographs, two pick-ups proved to be inexpensive design tools. Photograph, oscillograms, diagrams.

**11069* Control Devices Eliminate Flashovers Caused by Wheelslip.** J. R. Schoonover and H. R. Stiger. *Railway Locomotives and Cars*, v. 128, May 1954, p. 71-75.

Tests show motors and generators, with good maintenance, relatively immune to flashovers. Graphs, photographs.

**11070* Accessories for Oil Transformers.** (Dutch.) H. Wiersma. *Smit Mededelingen*, v. 9, no. 1, Jan.-Mar. 1954, p. 7-26.

Function, construction, and application for control; checking; and protection. Tables, diagrams, photographs.

**11071*** (Magnetic Amplifiers for Controlling Rapid Passenger Elevators.) **Magnetverstärker zum Regeln von Personen-Schnellaufzügen.** G. Sichling and H. Watzinger. *VDI Zeitschrift des Vereines deutscher Ingenieure*, v. 96, nos. 11-12, Apr. 15, 1954, p. 337-340.

Principles of operation, advantages, and limitations. Diagrams, photographs, graphs. 4 ref.

**11072*** (Electrical Machines on Merchant Ships.) **Elektrische Maschinen auf Handelsschiffen.** E. Schirmer and G. Seiffert. *VDI Zeitschrift des Vereines deutscher Ingenieure*, v. 96, nos. 11-12, Apr. 15, 1954, p. 355-363.

Regulation of motors and generators. Tables, graphs, photographs, diagrams.

**11073*** (A Process of Measuring the Phase and Amplitude Variation in Non-stationary High-Frequency Process.) **Ein Verfahren zur Messung des Phasen- und Amplitudenverlaufes nichtstationärer hochfrequenter Vorgänge.** Albert Essmann. *Zeitschrift für angewandte Physik*, v. 6, no. 3, Mar. 1954, p. 115-120.

Includes diagrams, photographs, graph. 11 ref.

**11074*** (The Behavior of Normal Gold-Chromium Resistors Under Change.) **Über das Verhalten von Goldchrom-Normalwiderständen bei Belastung.** Alfred Schulze and Dietrich Bender. *Zeitschrift für angewandte Physik*, v. 6, no. 3, Mar. 1954, p. 132-136.

Electrical and thermal behavior at different charges up to one watt. Diagrams, graphs, tables, photographs. 5 ref.

***See also:***

**11137** (switching circuits)
**11174** (manpower costs in steam generating stations)
**11261** (electric control for jet-engine)
**11269** (gas turbine for electric power generation)
**11307** (a.c. instrument-testing equipment)
**11364** (electrical controls)
**11966** (silicone-rubber cable insulation)

## ELECTROCHEMISTRY AND ELECTROPROCESSES

**11075 Diffusion Currents at Cylindrical Electrodes. A Study of Organic Sulfides.** M. M. Nicholson. *American Chemical Society, Journal*, v. 76, May 5, 1954, p. 2539-2545.

Convection effects at polarographic electrode can be simply controlled. Diaryl sulfides are most difficult to oxidize. Tables, graphs. 10 ref.

**11076* The Disruptive Discharge Potential of Passive Iron-Chromium Alloys in Sulfate Solutions.** (German.) Georg Masing, Theo Heumann, and Heinz Jesper. *Archiv für das Eisenhüttenwesen*, v. 25, nos. 3-4, Mar.-Apr. 1954, p. 169-179; disc., p. 179-180.

Anodic behavior of Fe, Pt, Fe-Cr alloys, and steel with 9.9% Ni and 18% Cr. Current density-voltage curves in $K_2SO_4$ and $H_2SO_4$ solutions measured at 20, 45, and 70 C. Voltage curve investigated as function of time. Graphs, tables. 11 ref.

**11077* Hydrogen Pick-up of Austenitic Steels in a Cathodic Charge.** (German.) Friedrich Eisenkolb and Günter Ehrlich. *Archiv für das Eisenhüttenwesen*, v. 25, nos. 3-4, Mar.-Apr. 1954, p. 187-194.

Effect of type of electrolyte; small additions of As, Pb, S, and Se; and conditions of electrolysis. Tables, graphs. 35 ref.

**11078 Advances in Electroplating.** W. H. Safranek. *Battelle Technical Review*, v. 3, May 1954, p. 49-52.

Uses and improvements in electroplating, bronze as a substitute for Ni, special electroplates, and electropolishing. Micrograph, oscillograms.

**11079* Recent Advances in Electrodeposition.** J. W. Cuthbertson. *Birmingham Metallurgical Society, Journal*, v. 33, Dec. 1953, p. 156-172.

A review. Tables, micrographs, photographs, graphs, diagram. 14 ref.

**11080* Poisoning of a Platinum-Platinum Electrode by Small Quantities of Electrolytically Deposited Cadmium.** (French.) Maurice Bonnemay. *Comptes rendus*, v. 238, no. 14, Apr. 5, 1954, p. 1512-1513.

Action of Cd deposited in a $CdSO_4$ and $H_2SO_4$ bath.

**11081*** (Surface Activity of Phenols and Amines on Zinc and Lead Electrodes.) **Poverkhnostnaia aktivnost fenolov i aminov na elektrodakh iz tsinka i svintsa.** G. Z. Kir'iakov. *Doklady Akademii Nauk SSSR*, v. 94, no. 6, Feb. 21, 1954, p. 1097-1099.

Influence of organic compounds on kinetics of electrode processes and as depositing substance during electrolysis of acid solutions of lead sulfamate and $ZnSO_4$. Graphs. 3 ref.

**11082* Mechanism of Electrodeposition Process of Chromium.** (Russian.) A. I. Levin, A. I. Falicheva, E. A. Ukshe, and N. S. Brylina. *Doklady Akademii Nauk SSSR*, v. 95, no. 1, Mar. 1, 1954, p. 105-109.

Investigation of Pt, Cr, Ni, Ag, Cu, and Zn cathodes for dependence of current strength on the potential. Graphs. 12 ref.

**11083 Contribution to the Theory of Electropolishing.** Carl Wagner. *Electrochemical Society, Journal*, v. 101, May 1954, p. 225-228.

Ideal process is characterized by plateau of current density-potential curve corresponding to maximum diffusion rate of acceptor for metal ions toward anode. Graphs. 15 ref.

**11084* Effects of Addition Agents on the Cathode Polarization Potential During the Electro-Deposition of Copper.** L. L. Shreir and J. W. Smith. *Faraday Society, Transactions*, v. 50, Apr. 1954, p. 393-403.

Includes graphs, tables. 15 ref.

**11085* Electrodeposition of Copper From the Triethanolamine Bath.** T. L. Rama Char and N. B. Shivaraman. *Indian Institute of Science, Journal*, v. 36, sec. A, Apr. 1954, p. 111-116.

Plating on steel from solutions containing Cu oxalate, nitrate, citrate, tartrate, and carbonate which do not deposit Cu by immersion. Tables. 11 ref.

**11086 Prefinished Metals.** C. P. Stewart. *Machine Design*, v. 26, May 1954, p. 174-176.

Characteristics and applications of preplated metals. Photographs, table.

**11087* Stop-Offs in Hard Chrome Plating.** Arthur W. Logozzo. *Metal Finishing*, v. 52, May 1954, p. 56-60.

Tools, methods, and materials; use of Pb foil and plastic sheet. Photographs.

**11088 Finishing Supplement. The British Electro-Plating Industry.** H. Silman. *Metal Industry*, v. 84, Apr. 30, 1954, p. 349-352.

Improvements in plant and equipment; new methods of construction to reduce maintenance costs. Table, micrograph, photographs, diagrams.

**11089* Determinations of Fluosilicic and Hydroboric Acid and Organic Compounds in Electrolytic Baths.** (German.) Fred Karsten. *Metalloberfläche*, Ausgabe B, v. 6, no. 4, Apr. 1954, p. 53-55.

Methods of determining and controlling electroytes including wetting agents. 2 ref.

**11090* Adhesiveness of Electrolytic Deposits.** (German.) Fritz Sautter. *Metalloberfläche, Ausgabe* B, v. 6, no. 4, Apr. 1954, p. 55-57.

Ollard, Knapp, Schlaupitz, and Robertson's methods of testing. Attempts to eliminate extraneous factors such as tensile strength and thickness of deposit which tends to mask true results. Diagrams. 6 ref.

**11091*** (Electropolishing With Rectified Current.) **Elektropolieren mit gleichgerichtetem Strom.** J. Steiner. *Metalloberfläche*, Ausgabe B, v. 6, no. 5, May 1954, p. 65-69.

Results on Cu, brass, stainless steel, and Al in different electrolytes. Graphs, diagrams, photographs. 6 ref.

**11092*** (Crack-Free Chromium Deposits.) **Rissfreie Chromniederschläge.** Heinz W. Dettner. *Metalloberfläche*. Ausgabe B, v. 6, no. 5, May 1954, p. 69-73.

Increased corrosion resistance and improved polishing properties. Micrographs, tables. 20 ref.

**11093* Cold and Anodic Oxidation of Cadmium. Researches on the Film Structure.** (Italian.) G. Bianchi. *Metallurgia italiana*, v. 46, no. 2, Feb. 1954, p. 49-53.

Investigation on nature and relationship of orientation of films with the base metal. Micrographs, tables, diffraction patterns. 8 ref.

**11094* Electrolytic Tinning.** (French.) J. P. Gustin. *Metallurgia italiana*, v. 46, no. 2, Feb. 1954, p. 54-61.

Characteristics and fields of application of various processes. Diagrams, photographs.

**11095*** (Electrolytic Deposits of Tin Alloys.) **Dépots électrolytiques d'alliages d'étain.** J. W. Cuthbertson. *Metallurgia italiana*, v. 46, no. 3, Mar. 1954, p. 85-90.

Experiments on Zn, Cu, Ni, Co, and Sb alloys of Sn.

**11096 Radiometric Study of the Chromium-Sulfate Complex Formed in Chromium Plating Baths.** Ronald L. Sass and Stanley L. Eisler. *Plating*, v. 41, May 1954, p. 497-501.

Ionic nature of coordination complex formed and amount of sulfate so complexed. Tables. 11 ref.

**11097 A.E.S. Research Report: Project No. 6: Porosity of Electrodeposited Metals. XIII. Variation of the Gas Permeability Constant With Pressure Difference.** N. Thon and Douglas Dean. *Plating*, v. 41, May 1954, p. 503-505.

Improved permeability apparatus which permits measurements over larger foil areas, used to study variation of permeability as function of overpressure. Diagram, graphs.

**11098* Studies on the Addition Agents Applied to the Electrodeposition of Metals. I. The Addition Agents Applied to the Electrodeposition of Copper From the Copper Sulphate Solution. II. Influence of Electrolytic Conditions Upon the Action of the Addition Agents.** (Japanese.) Minoru Kikuchi and Harukazu Toyoda. *Reports of the Government Chemical Industrial Research Institute, Tokyo*, v. 49, no. 1, Jan. 1954, p. 31-38.

Experimental results. Tables, graphs. 10 ref.

**11099* Addition of Surface Active Agents to the Nickel Plating Bath. I. Pin Holes of the Plated Nickel. II. Properties of the Baths.** (Japanese.) Minoru Kikuchi and Kikuma Oki. *Reports of the Government Chemical Industrial Research Institute, Tokyo*, v. 49, no. 2, Feb. 1954, p. 65-71.

Three kinds of agents were added to low and high pH Ni baths. Hydrogen over-voltage of bath measured with Haring Cell was increased by addition of agent. Tables, graphs. 4 ref.

**11100*** (Application of Hard Chrome Plating to Aluminum and Its Alloys.) **Les applications due chromage dur de l'aluminium et de ses alliages.** Charles Etienne. *Revue de l'Aluminium*, v. 31, no. 209, Apr. 1954, p. 139-143.

Friction properties, surface hardness, abrasion resistance, and resistance to alkaline solutions. Tables, graph, photographs. 3 ref.

## *Electrochemistry and Electroprocesses*

**11101* The Behavior of Zinc Anodes in Cyanide Baths.** (German.) Willi Machu, A. M. Azzam, and G. M. Habashi. *Werkstoffe und Korrosion*, v. 5, no. 4, Apr. 1954, p. 129-136.

Stable surface layer formed as result of reciprocal action of electrolytes. Passive Zn anodes show highest degree of polarization. Graphs, tables. 5 ref.

**11102* Problem of Porosity in Electroplating.** (Russian.) L. S. Sapiro. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 1, Jan. 1954, p. 26-29.

Cathode gas bubble formation and control measures. Diagrams. 8 ref.

**11103* Potentials in Separation of Nickel and Theory of Retarded Ion Discharge.** (Russian.) A. L. Rotinian, V. Ia. Zel'des, E. Sh. Ioffe, and E. S. Kozich. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 1, Jan. 1954, p. 73-80.

Cathode yields as function of pH at various concentrations of NaCl in the electrolyte. Graphs. 24 ref.

**11104* Mechanism of Effect of Surface-Active Substances on Electrodeposition of Metals.** (Russian.) A. I. Levin, E. A. Ukshe, and V. S. Kolevatova. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 1, Jan. 1954, p. 116-126.

Position of null point of the metal influences change of equilibrium potentials. Tables, graphs. 19 ref.

**11105* Influence of Potassium Ions on Electrodeposition of Copper.** (Russian.) S. V. Gorbachev and R. M. Vasenin. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 1, Jan. 1954, p. 135-146.

Polarization of Cu electrode, current density, and activation energy of conductivity. Graphs, diagrams. 21 ref.

**11106* Dispersibility of Complex Copper Electrolytes Containing Ethanol Amines.** (Russian.) A. V. Izmailov and S. V. Gorbachev. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 2, Feb. 1954, p. 229-235.

Effect of concentration, temperature, energy of activation, and electrode potential. Graphs, diagrams. 6 ref.

**11107* Dispersibility of Complex Copper Electrolytes Containing Sodium Pyrophosphate.** (Russian.) S. V. Gorbachev and A. V. Izmailov. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 2, Feb. 1954, p. 236-239.

Effects of concentration on distribution of metal on the C cathode. Graphs. 3 ref.

**11108* Temperature Effect on the Cathode During Electrodeposition of Powdered Cadmium.** (Russian.) D. N. Gritsan and A. M. Bulgakova. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 2, Feb. 1954, p. 258-264.

Changes with increased current density and decreased concentration of the electrolyte. Table, graphs. 11 ref.

**11109* Influence of Anions on the Temperature Effect on the Cathode During Electrodeposition of Powdered Metals.** (Russian.) D. N. Gritsan, A. M. Bulgakova, and G. A. Zolotareva. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 2, Feb. 1954, p. 337-344.

Increased magnitude of thermal effect on Cd, Zn, and Cu salts with increased current density. Tables, graphs. 9 ref.

**11110* Distribution of Direct-Current Electric Field in Electrolytic Cells.** (Russian.) V. P. Mashovets and G. V. Forsblom. *Zhurnal Prikladnoi Khimii*, v. 27, no. 3, Mar. 1954, p. 280-297.

Factors influencing slope angle of current lines to electrode surface. Diagrams, tables, graphs. 5 ref.

***See also:***
**10709** (ceramics in electrochemistry)
**10830** (analysis of plating wastes)
**10995** (electrolytic and chemical reduction)
**11013** (anodizing of Al)

## ELECTRONICS

**11111 Liquid Cold-Plate Method for Cooling of Air-Borne Electronic Equipment.** Marshall P. Sandelin. *Aeronautical Engineering Review*, v. 13, May 1954, p. 82-85, 93.

Weight objection overcome by unique construction method. Diagrams. 3 ref.

**11112 Operational Telemetering. An Aid to Air Navigation.** M. V. Kiebert, Jr. *Aeronautical Engineering Review*, v. 13, May 1954, p. 94-98.

Projected systems for separate applications. Diagrams.

**11113*** (The Electrical Conductivity of $Fe_2O_3$ With Additions of $TiO_2$.) **Die elektrische Leitfähigkeit von $Fe_2O_3$ mit Zusätzen von $TiO_2$.** Horst Grunewald. *Annalen der Physik*, v. 14, nos. 3-5, Feb. 15, 1954, p. 129-134.

Semiconducting properties. Graphs. 6 ref.

**11114* Semiconducting Properties of Cuprous Oxide. VIII. Electric Conductivity at 0 C as Function of Position Within the Specimen.** (German.) C. Fritzsche. *Annalen der Physik*, v. 14, nos. 3-5, Feb. 15, 1954, p. 135-140.

Includes graph. 12 ref.

**11115*** (Contribution to the Explanation of the Inaccuracy of Secondary-Electron Measurements.) **Ein Beitrag zur Erklärung der Ungenauigkeit von Sekundärelektronenmessungen.** O. Beer. *Annalen der Physik*, v. 14, nos. 3-5, Feb. 15, 1954, p. 201-214.

Direct-recording measuring instrument shows systematic deviations caused by positive ions formed on the object. Diagrams, graphs, tables. 18 ref.

**11116* The Importance of Electrical Contact in the Investigation of Cadmium Sulfide Monocrystals. I.** (German.) W. M. Buttler and W. Muscheid. *Annalen der Physik*, v. 14, nos. 3-5, Feb. 15, 1954, p. 215-219.

Production of CdS photocells with strictly ohmic current-voltage characteristics. Graphs. 7 ref.

**11117*** (Use of Short-Circuit Pistons for Design of Controlled Make-and-Break System.) **Utilisation des pistons de court-circuit pour l'etude des dérivations et des coupleurs directifs.** Albert Weissfloch. *Annales des Telecommunications*, v. 9, no. 3, Mar. 1954, p. 81-92.

Theory of hexa- and octo-pole linear transformers. Diagrams, graphs. 8 ref.

**11118* Punched-Card Calculations as Aid to Computation of Filters.** (German.) Walter Heimann. *Archiv der elektrischen Übertragung*, v. 8, no. 4, Apr. 1954, p. 173-178.

Problems of insertion-loss theory and application of punched-card calculators to solution of algebraic equations. Tables. 17 ref.

**11119* Equivalent Circuit Diagrams of Transistors and Their Physical Principles.** (German.) Johannes Malsch. *Archiv der elektrischen Übertragung*, v. 8, no. 4, Apr. 1954, p. 179-189.

Circuit gives satisfactory representation of transistor with frequency-independent circuit elements. Diagrams. 16 ref.

**11120*** (The Measuring of Network Harmonics.) **Fortschritte bei der Messung von Netzoberwellen.** W. Grunert. *Archiv für technisches Messen*, 1954, no. 219, Apr., p. 77-80.

Use of beat-note and resonances methods. Equipment for harmonic testing circuits. Photographs, diagrams, tables. 13 ref.

**11121 Digital Compters Take to the Air.** Philip Klass. *Aviation Week*, v. 60, May 10, 1954, p. 62 + 4 pages.

Details Digitac as principal element in a fully automatic tactical navigation and bombing system. Diagrams, photographs.

**11122* Precision Potentiometers for Analog Computers.** D. G. Blattner. *Bell Laboratories Record*, v. 32, May 1954, p. 171-177.

Construction and applications in fire control systems. Diagrams, photographs.

**11123* Mechanical Problems of Electron Tubes for L3 Carrier.** Edward J. Walsh. *Bell Laboratories Record*, v. 32, May 1954, p. 183-187.

Construction of new tubes having greater band width and operating stability, triple message carrying capacity. Graphs, diagrams, photographs.

**11124* What Is Science Doing to Electronics?** Ralph Bown. *Bell Telephone Magazine*, v. 33, Spring 1954, p. 27-34.

Solid state research yields devices promising extensive application. Photographs.

**11125* Cold-Cathode Gas-Filled Tubes as Circuit Elements in Automatic Telephony.** W. Six. *Communication News*, v. 14, no. 2, Jan. 1954, p. 58-69.

Electro-mechanical parts replaced by tubes for added speed, low power consumption, and over-all economic advantages. Photograph, diagrams, graphs. 7 ref.

**11126* Maximum Coefficient of Directional Activity of Linear and Flat-Top Antennas.** (Russian.) L. D. Bakhrakh. *Doklady Akademii Nauk SSSR*, v. 95, no. 1, Mar. 1, 1954, p. 45-48.

Two-dimensional problem with application of Matier functions. Graphs. 2 ref.

**11127* Theory of Multilayer Dielectric Coating.** (Russian.) V. V. Sukhanovskii. *Doklady Akademii Nauk SSSR*, v. 95, no. 2, Mar. 11, 1954, p. 245-248.

Theoretical and analytical method for calculating multilayer systems. Diagram, graphs, tables. 5 ref.

**11128*** (Gyrotropic Waveguide.) **Girotropnyi bolnovod.** M. A. Gintsburg. *Doklady Akademii Nauk SSSR*, v. 95, no. 3, Mar. 21, 1954, p. 489-492.

Behavior of electromagnetic waves in a confined gyrotropic medium. 6 ref.

**11129*** (Observation of the Fischer Gyromagnetic Effect in a Body Placed in a Waveguide.) **O nabliudenii giromagnitnogo effekta Fishera v tele, raspolozhennom v volnovode.** K. M. Polivanov. *Doklady Akademii Nauk SSSR*, v. 95, no. 5, Apr. 11, 1954, p. 969-970.

Possibility of application to measurement of fields in the range of ultra-high frequencies. Diagram. 4 ref.

**11130 A Cold-Cathode Scaling Unit.** C. D. Florida and R. Williamson. *Electronic Engineering*, v. 26, May 1954, p. 186-190.

Resolving time is 500 micro-sec. Lower cost makes use with G. M. tubes economical. Diagrams, photographs, graph. 4 ref.

**11131 Magnetic and Ferro-Electric Computing Components.** V. L. Newhouse. *Electronic Engineering*, v. 26, May 1954, p. 192-199.

Short expectancy of thermionic tubes enhances use of magnetic materials. Diagrams, tables. 26 ref.

**11132* Theory of Determining Permeability of Metal Ferro-magnets and Magnetic-Dielectrics According to Experimental Data.** (Russian.) K. M. Polivanov. *Elektrichestvo*, 1954, no. 3, Mar., p. 19-29.

Includes diagrams, graphs. 20 ref.

**11133*** (Electronic Equipment for Modelling Electromechanical Follower Systems.) **Elektronnaia ustanovka dlia modelirovaniia elektromekhanicheskikh sledíashchikh sistem.** L. V. Polonskaia. *Elektrichestvo*, 1954, no. 4, Apr., p. 41-45.

Automatic control system. Diagrams, graphs. 5 ref.

**11134* Semiconductors.** Karl K. Darrow. *Endeavour*, v. 13, Apr. 1954, p. 101-106.

Nature of semi-conductors; structure of solids in general. Graphs.

**11135 Transient Processes in Contactless Magnetic Relays.** I. B. Negnevitzkyi and L. L. Samurina. *Engineers' Digest*, v. 15, Apr. 1954, p. 147-150. (Digested from *Elektrichestvo*, 1950, no. 4, Apr., p. 46-50; 1953, no. 9, Sept., p. 64-60.)

Magnetic amplifier with a positive feedback operates as a relay and can be applied where a contactless relay is required. Diagrams, graphs.

**11136* What's Ahead for Industrial Radio?** Herbert E. Markley. *Flow*, v. 9, June 1954, p. 68-69, 94, 96.

Problems in use of industrial two-way radio.

**11137 The Synthesis of Sequential Switching Circuits. II.** D. A. Huffman. *Franklin Institute, Journal*, v. 257, Apr. 1954, p. 275-303.

Generalization of the secondary relay assignment problem and standard circuits. Diagrams, tables.

**11138* Propagation of Microwaves Through a Cylindrical Metallic Guide Filled Coaxially With Two Different Dielectrics. V.** S. K. Chatterjee. *Indian Institute of Science, Journal*, v. 36, sec. B, Apr. 1954, p. 48-58.

General conditional equation for deriving propagation characteristics of any mode. 1 ref.

**11139 A Single-Sideband Controlled-Carrier System for Aircraft Communication.** G. W. Barnes. *Institution of Electrical Engineers, Proceedings*, v. 101, pt. 3, no. 71, May 1954, p. 121-130; disc., p. 130-135.

Effects of carrier-frequency errors and incomplete sideband suppression. Requirements of single-channel techniques for long-range communication. Graphs, diagrams. 9 ref.

**11140 Telegraph Codes and Code Convertors.** T. Hayton, C. J. Hughes, and R. L. Saunders. *Institution of Electrical Engineers, Proceedings*, v. 101, pt. 3, no. 71, May 1954, p. 137-150; disc., p. 158-164.

Problem of interconnecting telegraph systems due to variety of codes in use. Methods of detecting and correcting errors. Diagrams, graphs, tables. 24 ref.

**11141 Code Convertors for the Interconnection of Morse and Teleprinter Systems.** R. O. Carter and L. K. Wheeler. *Institution of Electrical Engineers, Proceedings*, v. 101, pt. 3, no. 71, May 1954, p. 151-157; disc., p. 158-164.

Automatic conversion of international five-unit teleprinter code to international Morse code. Table, diagrams, graph.

**11142 An Experimental Investigation of the Properties of Corrugated Cylindrical Surface Waveguides.** H. E. M. Barlow and A. E. Karbowiak. *Institution of Electrical Engineers, Proceedings*, v. 101, pt. 3, no. 71, May 1954, p. 182-188.

Brass rods, of 3/16-in. outside diameter and grooved transversely at regular intervals, were employed to guide cylindrical surface-waves. Graphs. 19 ref.

**11143 A Hybrid-Ring Method of Simulating Higher Powers Than Are Available in Waveguides.** Leo Young. *Institution of Electrical Engineers, Proceedings*, v. 101, pt. 3, no. 71, May 1954, p. 189-190.

Method for subjecting component to effective power greater than magnetron output. Resistance to breakdown. Diagrams. 1 ref.

**11144* Some Electronic Instruments for Marine Turbine Research.** J. Hare and R. B. Conn. *Institution of Engineers & Shipbuilders in Scotland, Transactions*, v. 97, pt. 6, 1953-54, p. 417-460; disc., p. 461-470.

Instruments for noise and vibration analysis. Measurement of temperatures to about 450 F based on an electrical resistance material. Diagrams, photographs, graphs. 5 ref.

**11145 Frequency Variations of Junction-Transistor Parameters.** R. L. Pritchard. *I.R.E., Proceedings*, v. 42, May 1954, p. 786-799.

Theoretical solution of 4 small-signal parameters explains experimentally-observed frequency variation of open-circuit collector-base admittance of fused-junction *p-n-p* transistors. Diagrams, graphs. 18 ref.

**11146 Electron Beam Focusing With Periodic Permanent Magnet Fields.** J. T. Mendel, C. F. Quate, and W. H. Yocom. *I.R.E., Proceedings*, v. 42, May 1954, p. 800-810.

Experimental and theoretical results. Photograph, diagrams, graphs. 6 ref.

## *Electronics*

**11147 Switching Time in Junction Diodes and Junction Transistors.** Robert H. Kingston. *I.R.E., Proceedings*, v. 42, May 1954, p. 829-834.

An approximate solution is derived by considering behavior of minority carriers. Graphs, diagrams. 8 ref.

**11148 An Analogue Computing Circuit for the Evaluation of the Ratio of Two Slowly-Varying Potentials.** R. L. Gordon. *Journal of Scientific Instruments*, v. 31, May 1954, p. 166-169.

Electronic circuit accurately computes ratio of two potentials, displaying result as a meter deflection. Diagrams. 7 ref.

**11149* Silicon and Germanium Monocrystal Diodes.** (German.) M. Falter and G. Raabe. *Nachrichten Technik*, v. 4, no. 3, Mar. 1954, p. 125-129.

Advantages of crystal rectifiers over tube diodes; electrical properties of Ge and Si; and electrical behavior of Si and Ge diodes. Tables, graphs, photograph, diagrams. 12 ref.

**11150* Conductivity.** (German.) Brigitte Eckstein. *Nachrichten Technik*, v. 4, no. 3, Mar. 1954, p. 136-138.

Basic principles of electrical conductivity in semiconductors, transistors, electron and gas-discharge tubes, photoresistors, and metallic conductors. Effect of external influences. 8 ref.

**11151* Capacitance Measurements on Germanium-Indium Rectifiers.** (German.) Hans-L. Rath. *Naturwissenschaften*, v. 41, no. 7, Apr. 1954, p. 161-162.

Formation and methods of determining capacitance. Graphs. 10 ref.

**11152* Blocking Contacts Between Germanium and Vapor Deposited Metals.** (German.) Hans-Ulrich Harten. *Naturwissenchaften*, v. 41, no. 7, Apr. 1954, p. 162.

Vapor deposited Cu and Au on Ge has rectifying, photoelectric, and transistor effects but little blocking effect unless the *n*-conducting Ge has specific resistance greater than 0.2 ohm. Graphs. 6 ref.

**11153 Microwave System Design.** W. E. Sutter. *Petroleum Engineer*, v. 26, May 1954, p. D22-D24, D26-D27.

Practical aspects of designing and installing overall system. Diagrams, tables. (To be continued.)

**11154 Observations on a Form of Breakdown in Germanium Diodes.** A. Lempicki and C. Wood. *Physical Society, Proceedings*, v. 67, no. 412B, Apr. 1, 1954, p. 328-337.

Characteristic of diodes depends upon wave forms used to plot it by oscilloscopic means. Critical barrier temperature and barrier radius are obtained. Oscillogram, graphs. 9 ref.

**11155 Noise Immunity and Other Circuits.** Robert F. Scott. *Radio-Electronics*, v. 25, June 1954, p. 56-57.

Three methods to immunize control circuits from noise impulses. Diagrams.

**11156 Fundamental Properties of Semiconducting Materials.** Esther M. Conwell. *Sylvania Technologist*, v. 7, Apr. 1954, p. 41-44.

Conduction electrons and holes, impurties and defetcs in Ge and Si. Diagram. 29 ref.

**11157 Electron-Tube Life and Reliability. I.** Marcus A. Acheson. *Sylvania Technologist*, v. 7, Apr. 1954, p. 45-50.

Failure rate under specified conditions of operation including environmental, mechanical, and electrical factors found by binomial or Poisson formulas. Tables.

**11158 An Electron-Tube Frame Grid Adaptable to Automatic Production.** Robert E. Booth and Richard C. White. *Sylvania Technologist*, v. 7, Apr. 1954, p. 58-60.

Structure and fabrication. Photographs, graphs.

**11159*** (Physics of Thin Metallic and Semiconductive Layers.) **Fizika tonkikh metallicheskikh i poluprovodnikovykh sloev.** I. D. Konozenko. *Uspekhi Fizicheskikh Nauk*, v. 52, no. 4, Apr. 1954, p. 561-602.

Influence of structure on electrical and physical properties. Tables, graphs, micrographs. 99 ref.

**11160* Automatic Tuning for Primary Radar.** S. Ratcliffe. *Wireless Engineer*, v. 31, May 1954, p. 122-131.

Research on automatic frequency correction particularly for airborne microwave systems. Graphs, diagrams, table. (To be continued.)

**11161* Decade Counter.** Irving Gottlieb. *Wireless World*, v. 60, May 1954, p. 234-236.

Feedback used for converting binary to decade counting. Photograph, diagrams.

**11162* An Arithmetic Unit for Automatic Digital Computers.** (English.) John R. Stock. *Zeitschrift für angewandte Mathematik und Physik*, v. 5, no. 2, Mar. 15, 1954, p. 168-172.

Arithmetic operations. Design of unit. Diagram. 6 ref.

***See also:***
**10731** (electrical properties of ceramics)
**10832** (mass spectrometry in electronics)
**11367** (electronic autogenerator)
**11458** (uses of Ge)
**11868** (high frequency resistance of films)

## ENGINEERING ECONOMICS

**11163* Changing Technology of the Fertilizer Industry.** P. A. Retzke, G. F. Sachsel, and R. B. Filbert, Jr. *Agricultural Chemicals*, v. 9, May 1954, p. 37 + 8 pages.

Surveys composition, production, and consumption of commercial fertilizers. Tables, graphs. 16 ref.

**11164 Comparative Costs of Feul.** Myron L. Hineline. *Coal-Heat*, v. 66, May 1954, p. 7-8.

Coal and oil are compared with future supply in mind.

**11165 Electroprocess Plants in the TVA Power Service Area.** Harry A. Curtis. *Electrochemical Society, Journal*, v. 101, May 1954, p. 119C-127C.

Classification of electroprocess industries. 6 ref.

**11166* The Changing Pattern of Products Demand.** M. E. Hubbard. *Institute of Petroleum Review*, v. 8, May 1954, p. 85-89.

Includes graphs, diagrams.

**11167* Cost. Is It a Binding Principle or Just a Means to an End?** Samuel J. Broad. *Journal of Accountancy*, v. 97, May 1954, p. 582-586.

Cost usually provides best basis for implementing the realization concept in measuring income, departures from it may be needed for balance-sheet purposes. 4 ref.

**11168 How Proper Materials Selection and Use Leads to Cost Reduction.** *Materials & Methods*, v. 39, May 1954, p. 70-116.

Savings through design, form, and materials. 135 case histories. Photographs, diagrams.

**11169* Higher Tariffs and Increased Stockpiling by Gov't Would Result in Reasonable Zinc Price.** Howard I. Young. *Metals (Daily Reporter Monthly Supplement)*, v. 24, May 1954, p. 7-8.

Over half of U.S. mines closed due to inability to operate profitably; domestic production cut back 37% from its peak.

**11170 The Outlook for Natural Gas.** Clyde Williams. *Monthly Business Review*, 1954, May, p. 12.

Domestic use; fuel applications; and use of methane and other derivatives for synthetic rubbers, plastics, and fertilizers make need for present expansion and future research.

**11171 What's Ahead for Natural Gas?** Richard J. Gonzalez. *Oil and Gas Journal*, v. 53, May 10, 1954, p. 124, 127-132.

Rate of growth may slow down below high percentage gains of recent years. Annual increments will be large. Tables, graphs.

**11172* Costing Paint Production for Competitive Pricing.** Howard C. Woodruff. *Paint Industry Magazine*, v. 69, May 1954, p. 15-17.

Technique for accurate prediction of production costs. Graphs.

**11173 Economics of Cathodic Protection.** Wayne A. Johnson. *Petroleum Engineer*, v. 26, May 1954, p. D18-D19.

Bare or coated pipelines saved from costly leaks by cathodic protection. Graph.

**11174 Steam Generating Station Manpower Operating Costs.** *Power Engineering*, v. 58, May 1954, p. 88-89.

Manpower utilization ripe for improvement. Graphs.

**11175* Financing the Spanish Electrical Industry. Necessary Capital for the Period 1953-1960.** (Spanish.) José Luis Redonet Maura. *Revista de ciencia aplicada*, v. 8, no. 36, Jan.-Feb. 1954, p. 44-54.

Estimates power requirements and annual investments necessary. Probability of restrictions; average cost per kw.; and new necessary potentials. Tables.

**11176 Materials Selection. Teamwork Is the Trend.** Dwight Riley, Leo Bailey, and George Waldie. *Steel*, v. 134, May 17, 1954, p. 98-99.

Designers cannot hope to keep current with wealth of new or improved materials. Team approach is essential. Drawings.

***See also:***
**10770** (advances in chemical production)
**11017** (corrosion costs)
**11229** (economy of coal as fuel)
**11402** (review of metalworking in Canada)
**11474** (saving electric power)
**11738** (exploration expense in mining industry)
**11743** (economics of gas welds)
**12024** (economics in saw- and pulp-mills)
**12031** (U.S. consumption of pulp, paper, and board)

## FLUID MECHANICS

**11177* Adiabatic One-Dimensional Flow of a Perfect Gas Through a Rotating Tube of Uniform Cross Section.** K. Kestin and S. K. Zaremba. *Aeronautical Quarterly*, v. 4, Feb. 1954, p. 373-399.

Flow as in certain helicopter propulsion systems and wind-driven gas turbines. Equations of motion and energy are reduced to an ordinary non-linear differential equation. Graphs, tables, diagrams. 18 ref.

**11178 Elementary Derivation of Equations for Wave Speeds.** Austin J. O'Leary. *American Journal of Physics*, v. 22, May 1954, p. 327-334.

Transverse waves along a stretched wire and through an elastic solid; longitudinal waves through a fluid in a uniform tube, through a uniform rod, and along a stretched spring; long gravity waves through a shallow canal. Diagrams. 2 ref.

**11179 Convective Heat Transfer for Mixed, Free, and Forced Flow Through Tubes.** E. R. G. Eckert and A. J. Diaguila. *ASME, Transactions*, v. 76, May 1954, p. 497-504.

Turbulent flow through a vertical tube with a length-to-diameter ratio of 5. Diagram, graphs. 11 ref.

**11180* Dampening of Tangential Speed in Helicoidal Flow.** (French.) Cahit Ozgur. *Comptes rendus*, v. 238, no. 13, Mar. 29, 1954, p. 1378-1380.

Variation of speed near the wall as function of distance from the entrance. Graphs.

**11181* Shape of Flow of Gas-Liquid Mixtures in Horizontal Pipe.** (Russian.) M. A. Mologin. *Doklady Akademii Nauk SSSR*, v. 94, no. 5, Feb. 11, 1954, p. 807-810 + 1 plate.

Visual and photographic observations in various sized pipes at different velocities. Graphs, photographs. 9 ref.

**11182*** (Shape of Cavitation Region Caused by a Plate Normal to Flow.) **Formy oblasti kavitatsii normal'no obtekaemoi plastinki.** K. K. Shal'nev. *Doklady Akademii Nauk SSSR*, v. 94, no. 6, Feb. 21, 1954, p. 1017-1020 + 1 plate.

Includes table, graphs, photographs. 10 ref.

**11183 Flowmeter Engineering.** L. K. Spink and W. H. Howe. *Instruments and Automation*, v. 27, May 1954, p. 783-787.

Design of head-type meters. Special uses of electromagnet, sonic, and mass flowmeters. Diagrams, table.

**11184 On the Derivation of the Equations of Hydrodynamics From Statistical Mechanics.** Charles B. Morrey, Jr. *National Academy of Sciences of the United States of America, Proceedings*, v. 40, May 1954, p. 317-322.

Several methods to derive laws of mass motion of a "continuous medium" from study of motions of finite systems of particles. 1 ref.

**11185 Wanted: An Effective Pulsation Dampener.** Eric J. Lindahl. *Oil and Gas Journal*, v. 53, May 17, 1954, p. 108-110.

Nature of pulsation problem. Suggestions for future work. Diagrams, graph.

**11186 The Reflection of Shock Waves From a Blunt Wedge.** V. H. Blackman and D. K. Weimer. *Physical Review*, v. 94, ser. 2, May 1, 1954, p. 508-510.

Problem of shock wave of arbitrary strength reflecting from rigid wall. Results compared with calculations of Lighthill. Photographs, diagrams. 5 ref.

**11187*** (Space and Time Correlations in Turbulent Flow.) **Les corrélations d'espace et de temps dans un fluide turbulent.** J. Bass. *Recherche Aéronautique*, 1954, no. 38, Mar.-Apr., p. 13-14.

Experimental results of a relatively slow, practically incompressible flow in a wind tunnel. Graphs.

**11188* The Role of Coordinate Systems in Boundary-Layer Theory.** (English.) Saul Kaplun. *Zeitschrift für angewandte Mathematik und Physik*, v. 5, no. 2, Mar. 15, 1954, p. 111-135.

Flow fields depend on choice of coordinates. Different boundary-layer approximations to the flow problem are related to each other, to external flow, and to flow due to displacement thickness. Diagrams. 11 ref.

***See also:***
**11371** (fluids and "fluidized" solids handling)
**11543** (heat transfer during turbulent flow of molten metals)

## FOOD TECHNOLOGY

**11189* Acetin Fats. II. Preparation and Properties of Diacetin Fats From Some Common Vegetable Oils.** F. J. Baur. *American Oil Chemists's Society, Journal*, v. 31, May 1954, p. 196-199.

Includes photograph, tables, graph, radiograms. 8 ref.

**11190*** (Status of Research in Preservatives.) **Stand der Konservierungsmittel-Forschung.** M. v. Schelhorn. *Fette, Seifen, Anstrichmittel*, v. 56, no. 4, Apr. 1954, p. 221-224.

Effects of concentration, pH value, and composition. Relative effectiveness of combinations of preservatives with heat sterilization. Table. 13 ref.

**11191 Gaging Foods by Psychometrics.** Dean Foster. *Food Engineering*, v. 26, May 1954, p. 57-59, 196, 199.

By emphasizing human reactions rather than product, psychologist obtains more accurate information than with other approaches. Instruments play important role in controlling observer's environment. Photographs.

**11192 X-Rays Show More Than Insects.** M. J. Zunick and A. Pace. *Food Engineering*, v. 26, May 1954, p. 64-65, 139-140.

Techniques developed for detection of infestation in stored grain now to play star roles in process control. Radiographs, photographs. 6 ref.

**11193* Effect of Calcium Removal by Ion Exchange on the Properties of Fluid Milk.** Richard D. Coleman, Solomon J. Bishov, and J. H. Mitchell, Jr. *Food Technology*, v. 8, May 1954, p. 211-215.

Includes tables, graphs, diagram. 16 ref.

## *Food Technology*

**11194* Effect of Added Calcium Chloride and Sodium Hexametaphosphate (Calgon) on the Pectin Content and Serum Viscosity of Tomato Puree( Pulp).** Gordon L. Peters, H. D. Brown, W. A. Gould, and Rees B. Davis. *Food Technology*, v. 8, May 1954, p. 220-223.

Includes graphs, table. 14 ref.

**11195* Drying Problems in the Add-Back Process for Production of Potato Granules.** G. H. Neel, G. S. Smith, M. W. Cole, R. L. Olson, W. O. Harrington, and W. R. Mullins. *Food Technology*, v. 8, May 1954, p. 230-234.

Factors of potential importance in relation to abrasion and impact damage in pneumatic driers. Difficulties in determining effects of these factors. Diagrams, tables. 5 ref.

**11196* Butyric Acid Fermentation in Canned Pears and Tomatoes.** J. F. Bowen, C. C. Strachan, and A. W. Moyls. *Food Technology*, v. 8, May 1954, p. 239-241.

Spoilage caused by *Clostridium pasteurianum;* recommended means of control. Tables. 5 ref.

**11197* High Temperature Treatment of Shell Eggs.** Robert E. Feeney, L. R. MacDonnell, and F. W. Lorenz. *Food Technology*, v. 8, May 1954, p. 242-245.

Effectively prevents microbial spoilage if applied within 24 hours after exposure of eggs to contamination. Tables, graphs. 21 ref.

**11198* Dehydrated Foods. Changes in Physical Properties of Starch in Potato Granules During Processing.** A. L. Potter. *Journal of Agricultural and Food Chemistry*, v. 2, May 12, 1954, p. 516-519.

Tempering of granules down to 30% moisture and from 50 to 5 C changed solubility and swelling power of starch; gave improved product. Graphs, tables. 6 ref.

**11199* The Effect of Cation and Anion Resin Mixtures on the Salt Content of Raw Skimmilk.** G. K. Murthy and R. McL. Whitney. *Journal of Dairy Science*, v. 37, May 1954, p. 571-582.

Ionic composition is one important factor in stability of milk proteins and determines quality of finished product. Effects of mixtures of Nalcite HCR (a sulfonated copolymer of styrene and divinyl benzene) and Nalcite SAR (a quaternary amine resin). Graphs. 31 ref.

**11200 The Control of Insect Flight in Food Processing Plants by Residual Insecticides.** W. W. Sampson. *Journal of Economic Entomology*, v. 47, Feb. 1954, p. 87-93.

Results of preliminary laboratory tests and actual work in food processing plants. Tables. 28 ref.

**11201 Unsolved Problems in the Preservation of Food: The Influence of Cultural Conditions on the Quality and Preservation of Fruits and Vegetables.** R. G. Tomkins. *Journal of the Science of Food and Agriculture*, v. 5, Apr. 1954, p. 161-167.

Ripening and factors affecting it; physiological problems of storing fresh fruit; problems of canning, freezing, and drying; effect of fertilizers containing K. 19 ref.

**11202 Using $Co^{60}$ and Fission Products in Pork Irradiation Experiments.** H. J. Gomberg, S. E. Gould, J. V. Vehemias, and L. E. Brownell. *Nucleonics*, v. 12, May 1954, p. 38-42.

Use of reactor fuel slugs to break trichinosis cycle in large sections of pork. Photograph, diagrams, graphs. 15 ref.

**11203*** (Determining the Release of Zinc From Enamel of Cooking Utensils.) **Über die Bestimmung der Zinkabgabe aus Kochgeschirremails.** Armin Petzold and Ingeborg Lange. *Silikat Technik*, v. 5, no. 3, Mar. 1954, p. 102-105.

Zn toxicity in food, cooked in enamelled utensils containing ZnO. Chemical analysis for Zn in presence of Pb, Cd, Sn, Ni, Co, Fe, and Mn. Tables. 31 ref.

***See also:***

**10595** (effect of insecticides on flavor and color of vegetables)
**10676** (biological effectiveness of X-rays)
**10807** (residual herbicide on food crops)
**10971** (Al for food cans)
**11910** (polyethylene for food packaging)
**11939** (odor studies of cannery waste)
**11946** (disposal of canning wastes)

## FUELS AND COMBUSTION

**11204* Glossary of Gas Industry Terms: Spe to Up.** *American Gas Journal*, v. 180, May 1954, p. 41-44.
(To be continued.)

**11205 Interface Extension Versus Upper Limiting Time-Mean Energy-Release Rates of Constant-Pressure Steady-State Combustion Process.** W. J. Wohlenberg. *ASME, Transactions*, v. 76, May 1954, p. 679-687; disc., p. 688.

Concepts of size and distribution of mass elements sheared out by turbulence are added to interface theory. Diagrams, tables. 4 ref.

**11206 Pulverized-Coal-Fired Gasifier for Production of Carbon Monoxide and Hydrogen.** P. R. Grossman and R. W. Curtis. *ASME, Transactions*, v. 76, May 1954, p. 689-694; disc., p. 694-695.

Operating data and material requirements for this method of coal gasification. Design provides for handling of coal ash of widely varying fusing temperatures. Diagrams, tables, graphs. 4 ref.

**11207 Something Has Been Added.** L. C. Beard, Jr. *ASTM Bulletin*, 1954, no. 198, p. 51-56.

Description and applications of additives to gasoline, lubricants, and diesel oil. Graph, photographs, tables.

**11208*** (The Liberation of Oxygen From Oils in the Course of Their Pyrolysis.) **Sur le départ de l'oxygène des houilles au cours de leur pyrolyse.** C. Georgiadis and G. Gaillard. *Chaleur & Industrie*, v. 35, no. 345, Apr. 1954, p. 117-124.

Role and importance of O in oils during carbonization, oxidation, and hydrogenation. Experimental results. Graphs, table. 8 ref.

**11209* Research on Pressure Gasification of Coal.** *Chemical Engineering and Mining Review*, v. 46, no. 5, Feb. 1954, p. 179-181.

Survey of work in Australia and overseas on brown coal, including Lurgi process and Morwell project.

**11210* Fuel Economy in the Chemical Industry. I. The Fs.d. of Fuel Efficiency.** R. Walker. *Chemical & Process Engineering*, v. 35, May 1954, p. 137-140.

Economics of fuel conservation, choice of heating medium, fuels, and specifications of steam generating plant. Photographs, tables. 5 ref.

**11211 The Campbell Stoker.** John W. Tieman. *Coal-Heat*, v. 66, May 1954, p. 10, 12.

Tests with seven coals.

**11212*** (Combustion of Coke Particles Suspended in Gas.) **Gorenie gazovzvesi koksovykh chastits.** Z. F. Chukhanov and A. P. Chirkin. *Doklady Akademii Nauk SSSR*, v. 94, no. 6, Feb. 21, 1954, p. 1069-1072.

Kinetics of chemical process. Practical application. Graphs. 4 ref. Conduction electrons and holes, impurties and defects in Ge

**11213*** (Production of Methane Tagged by Carbon-14.) **Poluchenie metana mechennogo izotopom ugleroda $C^{14}$.** E. A. Andreev, B. V. Klimenok, and M. M. Sakharov. *Doklady Akademii Nauk SSSR*, v. 94, no. 6, Feb. 21, 1954, p. 1089-1091.

Method of production in presence of Ru as a catalyst in range between 240 and 310 C. Diagram. 3 ref.

**11214*** (The Role of Quenching in Reactions of Oxidation and Dissociation of Methane at High Temperatures and Pressures.) **Rol zakalki v reaktsiiakh okisleniia i razlozheniia**

**metana pri vysokikh temperaturakh i sverkhvyokikh davleniiakh.** Iu. N. Riabinin, A. M. Markevich, and I. I. Tamm. *Doklady Akademii Nauk SSSR*, v. 94, no. 6, Feb. 21, 1954, p. 1121-1124.

Investigates methane-air, -O, and -argon mixtures. Graph, tables. 4 ref.

**11215* Investigation of Rank in Coal by Differential Thermal Analysis.** Herbert D. Glass. *Economic Geology*, v. 49, May 1954, p. 294-309.

Recognition of distinct thermal-curve types, based on physical, chemical, and structural changes. Graphs, table. 11 ref.

**11216*** (The Process of Gasifying Solid Fuels.) **Die Verfahren zur Vergasung fester Brennstoffe.** D. Wagener. *Erdöl und Kohle*, v. 7, no. 4, Apr. 1954, p. 219-226.

Principles, efficiency, and critical survey of various methods. Tables, graphs. 30 ref.

**11217* Study on the Shrinkage of Coke.** (Japanese.) Takao Iwasaki, Seiichi Nomura, and Yoshitake Kon. *Fuel Society of Japan, Journal*, v. 33, no. 323, Mar. 1954, p. 143-147.

Measured changes of particles of semi-coke manufactured at constant volume. Relates fuel ratio or maximum driving pressure and contraction of coke. Graphs. 3 ref.

**11218* Producing Natural Gas Substitutes.** E. S. Pettyjohn, H. R. Linden, and W. G. Bair. *Gas Age*, v. 113, May 20, 1954, p. 19-26, 68, 70.

Continuous pressure gasification of light hydrocarbons offered as solution to supply of peak load gas. Photograph, diagrams, graphs, tables. 11 ref.

**11219 Pressure Limits of Flame Propagation of Propane-Air Mixtures.** Frank E. Belles, Dorothy M. Simon, and Robert C. Weast. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 1010-1013.

Quantitative relation between pressure limits and wall quenching. Diagram, graphs, tables. 13 ref.

**11220 Flow of Gasoline Thickened by Napalm.** George A. Agoston, Walter H. Harte, Hoyt C. Hottel, William A. Klemm, Karol J. Mysels, Harold H. Pomeroy, and John M. Thompson. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 1017-1019.

Experimental studies. Graphs. 6 ref.

**11221 Equilibrium Temperatures and Compositions Behind a Detonation Wave.** Alexander Weir, Jr. and Richard B. Morrison. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 1056-1060.

Temperatures and equilibrium compositions for detonation in propane-, hexane-, and acetylene-oxygen mixtures. Graphs. 11 ref.

**11222* The Nature of the Volatile Matter in Coke.** T. Bispham and F. R. Weston. *Institute of Fuel, Journal*, v. 27, Apr. 1954, p. 201-208.

Distillation of dried coke *in vacuo* at 965 C shows main constituents of gas are water vapor, oxides of C, and a gas corresponding to "end" coal gas evolved at end of carbonizing period. Diagram, tables, graphs. 9 ref.

**11223* The Stability and Compatibility of Fuel Oil and Diesel Fuel.** C. W. G. Martin and D. R. Bailey. *Institute of Petroleum Journal*, v. 40, May 1954, p. 138-150; disc., p. 151-154.

Physical and chemical stability; structure of asphaltene systems; manufacturing and practice; additives; assessment; control; and applications. Graphs. 24 ref.

**11224* Carbonization of South Arcot Lignite.** C. V. S. Ratnam and S. Veeraraghavan. *Journal of Scientific & Industrial Research*, v. 13, sec. B, Mar. 1954, p. 210-212.

Temperatures from 500 to 720 C. Char decreases and yields of tar and gas increase as temperature of carbonization rises. Tables. 11 ref.

**11225* Equipment at the New Swan Village Gasworks.** Rolt Hammond. *Mechanical Handling*, v. 41, May 1954, p. 230-237.

General layout and development of mechanical handling devices. Diagrams, photographs.

**11226 What Amyl Nitrate Does to Improve Diesel Fuels.** E. A. Desmond and G. C. Wilson. *Petroleum Processing*, v. 9, May 1954, p. 684-687.

Principal properties; used to improve ignition qualities. Diagram, graphs, tables.

**11227*** (The Area of the Outer Surface and the Shape Factor of Coke.) **Die Grösse der äusseren Oberfläche von Koks und eine Kennzahl für die Stengligkeit von Koks.** Walter Tietze. *Stahl und Eisen*, v. 74, no. 10, May 6, 1954, 618-620.

Optical process for measuring surface area of irregularly shaped bodies. Tables, diagram, photograph.

**11228*** (Liquid and Solid Fuel for Multistage Rockets.) **Razzi a stadi multipli a combustibile liquido.** Federico Mina. *Tecnica Italiana*, v. 9, no. 2, Mar. 1954, p. 121-128.

Various types of propellants. Flight requirements beyond the earth's atmosphere. Diagrams, tables, graphs. 5 ref.

**11229* Balanced Design. Key to Efficient Coal Utilization.** T. S. Spicer. *Utilization*, v. 8, May 1954, p. 23-27.

Advancements in technology of combustion and materials handling offer equal advantages of economy, dependability, and efficiency to large and small coal users. Photographs.

**11230* Physicochemistry of Coals.** (Russian.) L. M. Sapozhnikov and V. I. Kasatochkin. *Vestnik Akademii Nauk SSSR*, 1954, no. 2, Feb., p. 20-26.

Structures of organic substances in coal.

**11231* Investigation of Conditions for Ignition of Gas Mixtures. XXVI. Influence of Methylamine on Cold-Flame Oxidation of Butane and Butane-2.** (Russian.) A. A. Dobrinskaia, M. B. Neiman, and N. K. Rudnevskii. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 12, Dec. 1953, p. 1748-1791.

Includes graphs, tables. 14 ref.

**11232*** (Mechanism of Oxidation of Hydrocarbons in Gaseous Phase.) **Mekhanizm okisleniia uglevodorodov v gazovoi faze. V.** (Cold Flame Oxidation of Propane.) **Kholodnoplamennoe okislenie propana.** L. A. Repa and V. Ia. Shtern. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 3, Mar. 1954, p. 414-421.

Insignificant results at 280 C and pressure of 420 mm. of Hg. Tables, graphs. 8 ref.

**11233*** (Influence of Temperature on the Lower Concentration Boundary of Flame Propagation.) **O bliianii temperatury na nizhnii kontsentratsionnyi predel rasprostraneniia plameni.** M. A. Peshkin. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 3, Mar. 1954, p. 433-434.

Formula for calculation of individual hydrocarbon change with temperature. Graph. 2 ref.

***See also:***
**10701** (burners for producer gas)
**10823** (determination of C and H in fuels)
**10925** (oxidation of propane)
**11164** (cost of fuels)
**11170** (uses of natural gas)
**11171** (growth in production and use of natural gas)
**11484** (coke combustion in blast furnace)

## GEOLOGY AND MINERALOGY

**11234* Subsurface Interpretation of Intersecting Faults and Their Effects Upon Stratigraphic Horizons.** George Dickinson. *American Association of Petroleum Geologists, Bulletin*, v. 38, May 1954, p. 854-877.

Graphical study of hypothetical combinations of faults whereby more realistic subsurface interpretation may be deduced for complexly faulted structures. Diagrams, photographs.

## *Geology and Mineralogy*

**11235*** (Method of Investigation of Hungarian Radioactive Drilling Cores With a Geiger-Müller Beta Counter.) **Hazai fúrómagok rádióaktív vizsgálati módszere β-számláló Geiger—Müller-scovel.** János Csókás and Antal Adám. *Bányászati Lapok*, v. 9, no. 4, Apr. 15, 1954, p. 188-191.

Theoretical basis and experimental details of method, based on K content of the cores. Tables, graphs. 6 ref.

**11236* New Use for 3-D in Geology and Surveying.** L. J. Clarke. *Chemical Engineering and Mining Review*, v. 46, no. 5, Feb. 1954, p. 182-186.

Limitations of 2-D; equipment and techniques of experimental trials in stereo-photography, and applications. Photographs.

**11237* Microscopic Study of Coal.** (Spanish.) V. Hevia Rodriguez. *Combustibles*, v. 13, no. 70, Nov.-Dec. 1953, p. 403-428.

Structure; macro- and micro-scopic components; applications of coal petrography. Tables, micrographs. 87 ref.

**11238 Genetic Relations Between Granites, Porphyries, and Associated Copper Deposits.** Reno H. Sales. *Mining Engineering*, v. 6; *American Instiute of Mining and Metallurgical Engineers, Transactions*, v. 199, May 1954, p. 497-505.

Composition and origin of ore solution. Roles of S, silica, and water.

**11239* Enclosures in Gangue Minerals.** G. Mueller. *Mining Magazine*, v. 90, Apr. 1954, p. 208-217.

Minerology of fluorite gangue deposits and possible economic exploitation. Graph, table. 7 ref.

***See also:***
**10601** (mineralogy of phosphates)
**10810** (age of igneous rocks)

## GEOPHYSICS

**11240 The Attempt to Determine the Temperature of the Upper Layers of the Terrestrial Atmosphere From Observations of the Brightness of the Twilight Arc.** N. M. Shtaude. *Canada. Defence Scientific Information Service no.* T 118 R, Jan. 15, 1954, 3 p. (From *Dok. Akad. Nauk*, v. 74, no. 4, 1950, p. 703-705.)

Effects of second or higher order scattering on zenith brightness are corrected by new method. 4 ref.

**11241*** (The Character of the Absorption of Cosmic Particles at Different Altitudes.) **O kharaktere pogloshcheniia kosmicheskikh chastits na razlichnykh vysotakh atmosfery.** S. N. Vernov, V. A. Gladyshev, V. M. Filatov, A. N. Charrakhch'ian, and T. N. Charakhch'ian. *Doklady Akademii Nauk SSSR*, v. 94, no. 3, Jan. 21, 1954, p. 425-427.

Basic portion of charged particles is made up of electrons. Diagrams, graph. 7 ref.

**11242*** (Theory of Meteorological Effects of Cosmic Rays.) **K teorii meteorologicheskikh effektov kosmicheskikh luchei.** L. I. Dorman. *Doklady Akademii Nauk SSSR*, v. 94, no. 3, Jan. 21, 1954, p. 433-436.

Relation of change of shield, barometric effect, temperature, moisture content, and gravitational force. 6 ref.

**11243* The Nature of the Upper Atmosphere.** H. S. W. Massey. *Endeavour*, v. 13, Apr. 1954, p. 81-85.

Important effects of atmosphere which make life possible on Earth's surface are located at high levels. Graphs. 6 ref.

**11244* The Change of Meteorological Cycle During Irrigation.** (Russian.) M. P. Timofeev. *Izvestiia Akademii Nauk SSSR, Seriia Geofizicheskaia*, 1954, no. 2, p. 108-113.

Includes graphs. 3 ref.

**11245* Paleotemperatures of the Post-Aptian Cretaceous as Determined by the Oxygen Isotope Method.** H. A. Lowenstam and S. Epstein. *Journal of Geology*, v. 62, May 1954, p. 207-248.

Indicates progressive changes in ocean temperatures since the Cenomanian. Graphs, tables. 34 ref.

**11246 Hurricanes.** R. H. Simpson. *Scientific American*, v. 190, June 1954, p. 32-37.

By flying into clear "eye" of vast storms, meteorologists are learning of their complex origins, structure, and behavior. Photographs, diagrams.

***See also:***
**11775** (origin of cosmic rays)

## GRAPHIC ARTS

**11247* Offset Paper Conditioning.** Charles W. Latham. *American Printer*, v. 135, May 1954, p. 32-33, 54-54A.

Larger sheet sizes and multi-color work demand use of properly conditioned paper. Graphs, diagram.

**11248* Developments and Trends in the Printing Field.** Howard N. King. *American Printer*, v. 135, May 1954, p. 36-37, 65-67.

Possible future of newspaper advertising.

**11249* Xerography and Its Radiographic Applications.** W. D. Oliphant. *Discovery*, v. 15, May 1954, p. 182-184.

Advantages of process in medical applications. Xeroradiographs.

**11250* Fallacies in Color Reproduction.** Frank Preucil. *Graphic Arts Monthly*, v. 26, May 1954, p. 74 + 3 pages.

**11251* Advantages-Disadvantages of Dry Offset.** Lewis P. Sheldon. *Graphic Arts Monthly*, v. 26, May 1954, p. 116 + 7 pages.

**11252 High-Speed Photography.** John H. Waddell. *Mechanical Engineering*, v. 76, May 1954, p. 411-413.

Cameras and applications in analysis of motion. Photographs.

**11253* Practical Method for Determining Color Correction Masking.** H. Brent Archer and Warren L. Rhodes. *Modern Lithography*, v. 22, May 1954, p. 98 + 4 pages.

Based on reproduction of test chart of inks intended for later reproductions. Graphs, photographs. 1 ref.

**11254* Mechanisms of Color-Sensitization.** Lester Horwitz. *Photographic Science and Technique*, ser. 2, v. 1, no. 2, May 1954, p. 43-51.

Adsorption of sensitizing dye on photographic emulsion; correlation between photoconductivity and sensitization; and mechanism of transfer of energy by absorbing dye. Graphs, diagram. 30 ref.

**11255* An Inorganic Developer Reactivated by Electrolysis.** A. A. Rasch and J. I. Crabtree. *Photographic Science and Technique*, ser. 2, v. 1, no. 2, May 1954, p. 59-67.

Roman's inorganic developer, a solution of $V_2O_5$, $H_2SO_4$, and HBr reduced by electrolysis, successfully applied to continuous development of motion picture film. Tables, graphs, diagram, photographs. 8 ref.

**11256* Commercial Photography: Photography as a Profession; Sensitometry of Printing Papers; Demonstrating Colour Synthesis.** George L. Wakefield. *Process Engravers' Monthly*, v. 61, Jan. 1954, p. 20-23; Feb. 1954, p. 55-56; Mar. 1954, p. 83-84.

Includes graph.

**11257*** (Some Aspects of Gravure Printing on Supported and Unsupported Vinyl Film.) **Nagra synpunkter pa flerfärgsdjuptryck av buren och oburen vinylplastfolie.** Ingvar Carlson. *Svenska Plast Föreningen Tekniska Meddelanden*, v. 9, no. 6, Mar. 1954, 9 p. (TP986 Sv25t)

Principles, difficulties, and possibilities. Diagrams.

**11258*** (Mechanism of the Photographic Activity of Ionizing Particles.) **Mekhanizm fotograficheskogo deistviia ionizuiushchikh chastits.** A. L. Kartuzhanskii. *Uspekhi Fizicheskikh Nauk*, v. 52, no. 3, Mar. 1954, p. 341-376.

Basic differences between activity of light, electrons, μ-mesons, protons, and α-particles on photographic emulsions. Tables, graphs. 67 ref.

**11259*** **Use of Faraday Effect in Production of High Speed Shutters for Successive Photographs and for Flash X-Ray Photography.** (German.) Dietrich Elle. *Zeitschrift für angewandte Physik*, v. 6, no. 2, Feb. 1954, p. 49-54.

Includes photographs, diagrams. 12 ref.

**11260*** **Recovery of Silver From Alkaline Fixing Solutions by Light.** (Russian.) S. V. Vasil'ev. *Zhurnal Prikladnoi Khimii*, v. 27, no. 3, Mar. 1954, p. 258-264.

Complex $Ag_2S_2O_3$ reduced to Ag under visible and ultraviolet rays. Tables. 7 ref.

*See also:*
**11236** (stereo-photography in geologic surveying)
**11286** (reproduction of documents)
**11768** (B-loaded photo plate for slow neutrons)

## HEAT POWER

**11261 Integrated Electric Control for the General Electric J47-17 Jet Engine.** L. D. Brown. *Aeronautical Engineering Review*, v. 13, May 1954, p. 59-67, 73.

Engine construction, control methods, and engineering problems involved in single-lever control. Photographs, graphs, diagrams.

**11262*** **Aero Engine in the Twentieth Century.** G. D. Duguid. *Aeronautics*, v. 30, May 1954, p. 54-58, 61.

Summary of design and performance of piston-type engines. Graphs, photographs.

**11263 Modern Industrial Boiler Plant. I.** W. P. C. Ungoed. *Blast Furnace and Steel Plant*, v. 42, May 1954, p. 548-552, 554.

Guide to choice and operation. Problems associated with higher efficiencies. Graphs, table, diagram. (To be continued.)

**11264 The Gallatin Steam Plant of the Tennessee Valley Authority.** C. E. Blee and H. J. Peterson. *Combustion*, v. 25, May 1954, p. 34-39.

Features of principal equipment of the plant. Design trends in TVA steam plants. Diagram, graph, map, table.

**11265 Steam Purity Determination. II. Methods of Sampling and Testing.** P. B. Place. *Combustion*, v. 25, May 1954, p. 41-44.

Methods useful in tracing sources of carryover; determining operating limits of a boiler; and evaluating purity of the steam. Diagrams, graphs.

**11266 Economy of Large Generating Units.** H. P. Seelye and W. W. Brown. *Combustion*, v. 25, May 1954, p. 45-48.

Factors in selecting power equipment. Tables, graph.

**11267 Coal Burning Gas Turbine Progress in 1953.** John I. Yellott and Peter R. Broadley. *Combustion*, v. 25, May 1954, p. 55-57.

Excerpts from report presented Mar. 23, 1954, 1st Techno-Sales Conference, Bituminous Coal Research Inc., Columbus, O. Diagrams, photograph.

**11268*** **Improving Cooling System Performance.** *Diesel Railway Traction*, v. 8, May 1954, p. 118-120.

Thermo- and aero-dynamic consideration of engine cooling system. Diagrams, graphs. 5 ref.

**11269*** **Gas Turbine Ups Plant's Efficiency.** Louis S. Gee. *Electrical World*, v. 141, May 31, 1954, p. 71-74.

Installation in old steam station results gains of 15.15% in thermal efficiency, 32% in dollar economy, and generating capacity increase to 6,611 kw. at $76.37 per kw. cost. Diagrams, table.

**11270*** **Aeronautical Compound Diesel Engine.** *Engineer*, v. 197, Apr. 30, 1954, p. 637-640.

Details of economical 3,135 hp. engine. Diagrams, graphs, photographs.

**11271*** **Compound Diesel Engines for Aircraft.** E. E. Chatterton. *Engineer*, v. 197, Apr. 30, 1954, p. 647-648.

Thermodynamic and mechanical aspects of compounding a gas turbine with a reciprocating internal combustion engine. Table, graph.

**11272 Symposium on Boiler Water Chemistry.** *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 953-997.

Includes "Practical Performance of Water-Conditioning Gadgets", B. Q. Welder and Everett P. Partridge; "Analysis of Water-Formed Deposits", F. U. Neat and A. A. Berk; "Scheme for Analysis of Industrial Water", J. H. Phillips and K. G. Stoffer; "Significance and Application of Water Analysis Data", R. C. Ulmer; and "Significance of Boiler Deposit Analysis", Frank E. Clarke and Robert D. Hopkins.

**11273 Preflame Oxidation of Hydrocarbons in a Motored Engine.** A. J. Pahnke, P. M. Cohen, and B. M. Sturgis. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 1024-1029.

High-temperature, vapor-phase oxidation reactions of hydrocarbons in engines. Tables, graphs. 15 ref.

**11274 Effect of Preflame Oxidation on Engine Knock.** Cleveland Walcutt, James M. Mason, and E. R. Rifkin. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 1029-1034.

Shows 2 classes of reactions which can precede knock. Diagrams, graphs. 12 ref.

**11275 The Packaged Boiler Picture—Special Report.** *Industry and Power*, v. 66, May 1954, p. 67-90.

Developments in packaged boilers in recent years. Carefully prepared, illustrated summary of applications for packaged units points to future uses. Photographs, table.

**11276 Turbine Research.** Donald L. Mordell. *Instrumentation*, v. 7, no. 3, 1954, p. 18-19.

Time-saving instruments in research on coal-burning gas turbine, may mean new and economical source of railroad motive power. Photographs.

**11277 The Future of the Turbo Compound Engine.** Russel R. Mock and Norton B. Jamieson. *Mechanical Engineering*, v. 76, May 1954, p. 403-406.

Development of turbo-compound engine could provide airlines with economical and reliable transports. Graphs, photograph.

**11278 Detect BF Pump Load-Drop Cavitation Mathematically.** S. Baron. *Power Engineering*, v. 58, May 1954, p. 69-72.

Protection for sudden load drops on steam turbines lead to pressure decay conditions capable of causing cavitation in the BF pump. Graph, tables.

**11279*** **Design for an Atomic Locomotive.** *Railway Locomotives and Cars*, v. 128, May 1954, p. 51-55.

Calculations showing requirements for a locomotive which could use nuclear fuel. Diagram, tables, graph.

**11280*** (Utilization of Heat From Waste Gases of Glass Furnaces.) **Ispol'zovanie tepla otkhodiashchikh gazov steklovarennykh pechei.** D. B. Ginzburg and S. S. Cherniakov *Steklo i Keramika*, v. 11, no. 4, Apr. 1954, p. 22-25.

Transformation of heat from gases to usable steam. Diagrams, table.

*See also:*
**11144** (turbine research)
**11336** (engine wear)
**11338** (engine lubrication)
**11342** (lubrication of diesel engines)
**11352** (testing of turbine oils)
**11407** (steels for steam power plant)
**11844** (heat transfer in gas furnace)

## INFORMATION—PREPARATION AND DISSEMINATION

**11281*** **Making Meetings Pay Off.** William E. Bright, Jr. *American Business*, v. 24, May 1954, p. 14-16.

Tips on public speaking and improving staff meetings. Drawings.

*Information—Preparation and Dissemination*

**11282 Studies in Chemical Documentation. III. Mechanized Documentation.** G. Malcolm Dyson. *Chemistry & Industry*, 1954, no. 16, Apr. 17, p. 440-449.

Recording and organizing information to permit correlation or selection. Tables, diagrams, photographs. 17 ref.

**11283* PDQ Photocopying at P.D.&D.** M. DiPietro. *Industrial Photography*, v. 3, May-June 1954, p. 22-23.

Information requests facsimile-reproduced by the thousands. Photographs.

**11284 The Universal Decimal Classification Applied to Metallurgical Literature.** Einar Öhman and J. P. Saville. *Iron and Steel Institute, Journal*, v. 177, May 1954, p. 183-188.

Need for rapid and accurate means of classifying. Describes system, its construction, and present state. 5 ref.

**11285* The Preparation of Subject-Heading Lists by Automatic Punched-Card Techniques.** Eugene Garfield. *Journal of Documentation*, v. 10, Mar. 1954, p. 1-10.

Outlines approaches and uses in this special area. Table, diagram. 2 ref.

**11286* Document Reproduction by Photography in the United States.** Walter Clark. *Photographic Science and Technique*, ser. 2, v. 1, no. 2, May 1954, p. 31-37.

Intermediate film method for making paper copies, new direct positive papers, microcopying, extra-rapid processing, special image transfer techniques, and pseudo-photographic methods. Photographs, diagrams. 25 ref.

**11287 The Language Problem of Science.** J. E. Holmstrom. *Research*, v. 7, May 1954, p. 190-195.

Difficulties met in technical translating, use of mechanical aids, and adoption of internationally understood languages.

***See also:***
**11140** (telegraph code convertors)
**11141** (telegraph code convertors)
**11800** (information handling in task groups)

## INSTRUMENTATION AND LABORATORY APPARATUS

**11288*** (Lengthened Levels of Geiger-Müller Counter With Glass Cathodes.) **L'allongement du palier des compteurs GM a cathode en verre.** S. Michalak, B. Mowczan, and A. Zawadzki. *Acta Physica Polonica*, v. 13, no. 2, 1952, p. 145-149.

Comparison of Maze type with counters having internal metal cathode. Graphs, diagram. 7 ref.

**11289* Investigations Concerning Light Sources for Spectrum Analysis. V. High Voltage Spectrographic Spark Source With Electronic Control.** (English.) A Bardócz. *Acta Technica Academiae Scientiarum Hungaricae*, v. 8, nos. 1-2, 1954, p. 99-107.

Includes diagrams, photograph, graphs. 12 ref.

**11290*** (The Chromatic Aberration of Electron Lenses.) **Bemerkungen zur chromatischen Aberration von Elektronenlinsen.** H. Grümm. *Annalen der Physik*, v. 14, nos. 3-5, Feb. 15, 1954, p. 193-200.

Includes graphs, diagram. 10 ref.

**11291*** (The Dynamic Adjustment of Measuring Values in Electrical Measurements of Temperature.) **Zur dynamischen Anpassung von Messwerken bei der elektrischen Temperaturmessung.** Karl Heinz Winterling. *Archiv für technisches Messen*, 1954, no. 219, Apr., p. 73-76.

Includes graphs. 7 ref.

**11292*** (Progress in the Field of Recording Technology With a Light-Ray Oscillograph.) **Fortschritte auf dem Gebiete der Aufnahmetechnik mit Lichtstrahloszillographen.** W. Hartel and J. Oemigk. *Archiv für technisches Messen*, 1954, no. 219, Apr., p. 85-86.

Fundamental principles; typical applications; and example. Diagrams.

**11293*** (A New Concave-Reflector Pyrometer "Ardonox" for Measuring Low Temperatures.) **Ein neues Hohlspiegel-Pyrometer "Ardonox" zur Messung niedriger Temperaturen.** Fritz Lieneweg. *Archiv für technisches Messen*, 1954, no. 219, Apr., p. 87-88.

Construction and operating details. Diagrams, photographs, graph. 6 ref.

**11294 Impact Tester for Textiles.** J. B. Dickson and L. A. Davieau. *ASTM Bulletin*, 1954, no. 198, p. 85-90.

Versatile tester adapted to determining impact tensile strength of yarns and fabric strips or tear resistance of fabrics. Tables, diagrams, photographs. 4 ref.

**11295*** (Measuring Technology.) **Messtechnik.** H. Lindorf. *Brennstoff-Wärme-Kraft*, v. 6, no. 4, Apr. 1954, p. 141-143.

Development of resistance thermometers, thermoelements, pyrometers, "wiped" Sb electrodes for pH measurements, and magnetic oxygen meter. Diagrams. 18 ref.

**11296 A New Thermal Conductivity Apparatus for Refractory Materials.** J. F. Clements and J. Vyse. *British Ceramic Society, Transactions*, v. 53, Feb. 1954, p. 134-155.

Employs plane horizontal test specimen and water-flow calorimeter; is provided with system of peripheral electrical heaters to reduce lateral heat flow. Tables, diagrams, graphs. 8 ref.

**11297* Development of Differential Pressure Measuring Equipment for High-Pressure Hydrogenation.** (German.) W. Kundt. *Chemische Technik*, v. 6, no. 3, Mar. 1954, p. 138-140.

Various pressure recorders and controls. Table, photographs, diagrams. 8 ref.

**11298*** (Measurement of Nitrogen Adsorption in Sodium Chloride by Means of a Highly Sensitive Quartz Microbalance.) **Izmerenie adsorbtsii azota na khloristom natrii pri pomoshchi kvartsevykh mikrovesov vysokoi chuvstvitel'nosti.** B. P. Bering and V. V. Serpinskii. *Doklady Akademii Nauk SSSR*, v. 94, no. 3, Jan. 21, 1954, p. 497-500.

Construction and manipulation of an improved microbalance. Diagrams, graphs. 8 ref.

**11299* Fabry-Pérot Interferometer With Dielectric Mirrors.** (Russian.) F. A. Korolev and V. V. Sukhanovskii. *Doklady Akademii Nauk SSSR*, v. 95, no. 1, Mar. 1, 1954, p. 53-55.

Advantages of replacing metal with multilayer dielectric films. Graphs. 12 ref.

**11300 A High-Speed Electro-Magnetic Counter.** G. H. Townend. *Electronic Engineering*, v. 26, May 1954, p. 211-213.

Counter suitable for industrial application; speeds up to 60 counts per sec. using only 0.25 watt. Diagrams, drawing.

**11301* Recent Developments in Light Ray Oscillographs.** (German.) W. Härtel and C. Sörsensen. *Elektrotechnische Zeitschrift*, v. 6, Ausgabe B, no. 4, Apr. 21, 1954, p. 109-113.

Principle, operation, design, and use in recording rapidly occuring processes. Diagrams, photographs, graph, oscillograms. 4 ref.

**11302* The Stroboscope and Its Uses.** (German.) G. Garske. *Elektrotechnische Zeitschrift*, v. 6, Ausgabe B, no. 4, Apr. 21, 1954, p. 115-117.

Operation and use of mechanical and photoflash stroboscope. Photographs, diagrams. 5 ref.

**11303* Assessment of Particle Size.** H. H. Watson and A. J. Cruise. *Engineering*, v. 177, May 7, 1954, p. 594-596.

Determination of two profile parameters for irregular shapes. Diagrams, tables, graphs. 4 ref.

**11304* Unified Standards for Limits and Fits.** Rowland Hill. *Engineering Journal*, v. 37, May 1954, p. 576-585.

Various national standard systems; development of new ABC system. Diagrams, graphs, tables.

**11305*** (Microscopic Determination of the Composition of Heterodispersed Grain Mixtures.) **Zur mikroskopischen Bestimmung der Zusammenstzeung heterodisperser Korngе-**

**mische.** Rudolf Mosebach. *Erdöl und Kohle*, v. 7, no. 4, Apr. 1954, p. 199-203.

Approximation formula determines surface and size distribution of pulverized substances. Tables, graphs. 2 ref.

**11306*** (Principle and Methods of Measuring Turbidity Independent of Pigmentation.) **Das Prinzip und die Methoden der farbunabhängigen Trübungsmessung.** H.-D. Schulz-Methke. *Fette, Seifen, Anstrichmittel*, v. 56, no. 4, Apr. 1954, p. 242-245.

Turbidity measuring devices. Diagrams, graphs. 5 ref.

**11307 Alternating-Current-Instrument Testing Equipment.** A. H. M. Arnold. *Institution of Electrical Engineers, Proceedings*, v. 101, pt. 2, no. 80, Apr. 1954, p. 121-131; disc., p. 131-133.

National Physical Laboratory methods for calibrating to accuracy of 0.1% of full-scale. Diagrams, tables. 14 ref.

**11308 Strain Gage Metering.** G. L. Barnette and R. A. Collins. *Instrumentation*, v. 7, no. 3, 1954, p. 14-15.

New automatic weighing system measures resin flow. Photographs, diagram.

**11309 Precision Elements.** C. F. Alban. *Instrumentation*, v. 7, no. 3, 1954, p. 33-35.

Design and uses of thermostatic bimetals. Photographs.

**11310 Optics and Appearance Instrumentation.** Richard S. Hunter. *Instrumentation*, v. 7, no. 3, 1954, p. 36-41.

Operation and application of photometric instruments in measurement of light, reflectance, color, gloss, absorptance, and similar photometric variables. Photographs, table, diagrams.

**11311 A Colorimeter for Pyrotechnic Smokes.** Isadore Nimeroff and Samuel W. Wilson. *Journal of Research, National Bureau of Standards*, v. 52, Apr. 1954, p. 195-199.

Tristimulus photoelectric colorimeter designed to measure chromaticities of smokes having highly saturated colors. Tables, diagrams, graphs. 9 ref.

**11312 Simplification of Calculations in Routine Density and Volumetric Determinations.** Charles T. Collett. *Journal of Research, National Bureau of Standards*, v. 52, Apr. 1954, p. 201-204.

Approximations avoided by minor changes in procedure that simplify calculations. Use of counterpoises eliminates some buoyancy corrections. 7 ref.

**11313 Multirange, Audiofrequency Thermocouple Instruments of High Accuracy.** F. L. Hermach and E. S. Williams. *Journal of Research, National Bureau of Standards*, v. 52, May 1954, p. 227-234.

Used with d.c. potentiometer for measurements of a.c. voltage and current with accuracy of 0.05% at frequencies up to 20 kc. per sec. Second is a 0.5% multirange volt-ammeter with simple circuits so thermal converter may be checked. Photographs, tables, graph, diagrams. 3 ref.

**11314 A Comparator for Materials of Low Magnetic Susceptibility.** D. A. Abbott and R. Kilgour. *Journal of Scientific Instruments*, v. 31, May 1954, p. 155-158.

Magnetic states of weakly magnetic materials, such as phosphor bronze, Cu, and filled rubber are compared. Diagrams, photographs.

**11315 A New Radiometer.** J. T. Houghton and A. W. Brewer. *Journal of Scientific Instruments*, v. 31, May 1954, p. 184-187.

Measures direct flux of radiant energy integrated throughout a hemisphere. Consists of a light electrical resistance thermometer element which is suspended, thermally isolated in high vacuum, behind an infra-red transmitting window. Diagrams, graph. 7 ref.

**11316*** (The Plastifikator. A New Plasticizing Machine for PVC.) **Der Plastifikator, eine neue Geliermaschine für PVC.** Adolf Vogt. *Kunststoffe*, v. 44, no. 4, Apr. 1954, p. 151-153.

Design and operation. Table, graph, diagram, photographs.

**11317* How Functional Specifications Affect Gaging Requirements.** Earle Buckingham. *Machinery*, v. 60, May 1954, p. 185-191, 211.

Tolerances established to control variations in size, form, position, and function. Need for functional specifications and determination of gaging requirements. Diagrams.

**11318*** (The Extended Evaluation of Diagrams of Chévenard Micro-Tensile Testing Machine.) **Zur erweiterten Auswertung von Diagrammen der Mikro-Zerreissmachine nach Chévenar.** H. Hendus and H. Rohrig. *Metall*, v. 8, no's 9-10, May 1954, p. 371-373.

Advantages in research, production control, and computation of different functions. Diagrams, graphs, photograph. 5 ref.

**11319* Electronic Micrometers.** (German.) L. A. Gontscharski. *Nachrichten Technik*, v. 4, no. 3, Mar. 1954, p. 107.

Operation of highly sensitive and stable instrument. Diagrams.

**11320* Trends in Modern Viscometry. I.** E. G. Ellis. *Petroleum*, v. 17, May 1954, p. 157-159, 168.

Historical developments, conversion of units, effects of temperature, and precision obtainable in measurement. Table, photograph, graph. 5 ref.

**11321 Thermostatic Controls.** Frank Appleton. *Product Engineering*, v. 25, May 1954, p. 176-180.

Temperature protectors for equipment protection. Photographs.

**11322 Study of a Deformed State by Radioactive Isotopes.** S. I. Gubkin and S. A. Dovnar. *National Science Foundation Translation, no.* 145, Dec. 1953, 2 p. (From *Doklady Akademii Nauk SSSR*, v. 91, 1953, p. 1089-1090.)

Previously abstracted from original. See item 3550, v. 3, Mar. 1954.

**11323*** (Principles and Construction of a New Infra-Red Spectrophotometer.) **Principes de construction et réalisation d'un Nouveau spectrophotomètre infra-rouge.** K. F. Luft and H. Maillet. *Recherche Aéronautique*, 1954, no. 38, Mar.-Apr., p. 43-51.

Apparatus with automatic recording of transparency, constant practical resolving power from 1 to 15$\mu$, and logarithmic wave length scale. Diagrams, spectrographs. 16 ref.

**11324*** (Improving the Stability of Resistance Strain Gages Subjected to Alternating Forces.) **Amélioration de la résistance aux efforts alternés des jauges extensométriques a fil résistant.** Georges Vidal, Jean Laxague, and Pierre Lanusse. *Recherche Aéronautique*, 1954, no. 38, Mar.-Apr., p. 53-56.

Tests on steel and Al alloys. Diagrams, tables, photograph, micrograph.

**11325 A Calorimeter for Rapid Determination of Heat Loss and Heat Production in Laboratory Animals.** Richard W. Lawton, Lawrence R. Prouty, and James D. Hardy. *Review of Scientific Instruments*, v. 25, Apr. 1954, p. 370-377.

Permits critical experiments on thermo-regulatory mechanisms of animals. Loss measured by electric hygrometer; production by Pauling analyzer. Graphs, table, diagrams. 8 ref.

**11326 The Role of the Instrument Engineer in Industry and Production.** C. M. Gilmour. *Sheet Metal Industries*, v. 31, no. 325, May 1954, p. 378-382, 390.

Operation and maintenance of modern control systems. Diagrams, photographs. (To be continued.)

**11327* An Improved Strain Gage for Precise Force Measurement in Single Fibers.** Walter J. Thorsen. *Textile Research Journal*, v. 24, May 1954, p. 407-413.

Improved gage is sensitive to small forces; has high precision and accuracy; is simple to construct. Photomicrograph, graph, diagrams. 15 ref.

**11328*** (The Double-Nozzle Tube. A New Flow-Measuring Device.) **Das Doppeldüsenrohr, ein neues Durchfluss-Messgerät.** E. Schröder. *VDI Zeitschrift des Vereines deutscher Ingenieure*, v. 96, nos. 11-12, Apr. 15, 1954, p. 347-348.

Arrangement shows considerably lower pressure loss than normal Venturi tube. Diagram, graphs.

*Instrumentation and Laboratory Apparatus*

**11329* Selection of Main Line Meters Simplified by Use of Charts.** John C. Thoresen. *Water & Sewage Works (Reference and Data Edition)*, v. 101, May 1954, p. R55-R59, R61-R62.

Head losses in Venturi and orifice meters determine their relative economy. Diagrams, graphs, charts.

**11330* Instrument Error Curves.** M. G. Scroggie. *Wireless World*, v. 60, May 1954, p. 218-219.

Offers calibration data in convenient form. Graphs.

**11331* Extremely Small Probes for Measuring Ultrasonic Fields in Liquids.** (German.) Günter Bolz. *Zeitschrift für angewandte Physik*, v. 6, no. 2, Feb. 1954, p. 54-59.

Investigates a piezoelectric probe made of crystals such as tourmaline or $BaO \cdot TiO_3$. Diagrams, table. 11 ref.

**11332*** (Measuring Pressure With the Pirani Manometer.) **Zur Druckmessung mit dem PIRANI-Manometer.** Klaus-Dieter Mielenz. *Zeitschrift für angewandte Physik*, v. 6, no. 3, Mar. 1954, p. 101-104.

Design, operation, and sensitivity variation. Diagrams, graphs, tables. 2 ref.

**11333*** (Thermodynamic Investigation at Low Temperatures.) **Termodinamicheskii issledovaniia pri nizkikh temperaturakh. II.** (Measurement of Heat Capacity of Solid Bodies and Liquids Between 12 and 300 K.) **Izmerenie teploemkosti tverdykh tel i zhidkostei mezhdu 12 i 300°K.** P. G. Strelkov, E. S. Itskevich, V. N. Kostriukov, G. G. Mirskaia, and B. N. Samoilov. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 3, Mar. 1954, p. 459-472.

Vacuum colorimeter with screening shield permits low temperature measurements. Diagrams, graph. 3 ref.

***See also:***
**10664** (magnetic $O_2$ analyzer)
**10850** (thermograph)
**11066** (design of Mo-wound electric furnaces)
**11144** (noise and vibration instruments)
**11183** (flow meters)
**11296** (thermal conductivity apparatus)
**11710** (electron microscopy of metals)

## LUBRICATION AND FRICTION

**11334* Twenty-Five Years of Crankcase Oil Performance.** Earl Bartholomew. *American Petroleum Institute, Proceedings*, sec. II. *Marketing*, v. 33, 1953, p. 45-52.

Reviews properties as a guide to future developments. Viscosity and additives considered. Tables, photographs. 2 ref.

**11335* Analysis of Bearing Failures.** Henry W. Leutkemeyer. *American Petroleum Institute, Proceedings*, sec. II. *Marketing*, v. 33, 1953, p. 53-59.

Determination of type of bearing failure and suggested causes. Micrographs, graphs, photographs.

**11336 Engine Wear as Affected by Lubricant Composition.** H. C. Mougey. *ASTM Bulletin*, 1954, no. 198, p. 57-63; disc., p. 63-64.

Corrosive, friction, and abrasive wear from view point of engine design, operating conditions, fuels, and lubricants. Photographs, graphs, tables. 10 ref.

**11337 Wear In Bearings.** Charles H. Junge. *ASTM Bulletin*, 1954, no. 198, p. 64-69.

Characteristics of types of wear encountered under many conditions; different types of bearing failures; and corrective measures which can be employed. Graphs, micrographs, photographs.

**11338 Lubricating Oil Requirements of the Modern Automotive Engine.** J. P. Hamer, T. S. Tutwiler, and C. A. Weisel. *ASTM Bulletin*, 1954, no. 198, p. 70-76; disc., p. 76-77.

Factors in formulation of satisfactory lubricating oils. Graphs, tables. 8 ref.

**11339* Timken Conical Roller Bearings on Rolling Mill Cylinders.** Riou. (French.) *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques*, 1954, no. 3, p. 561-574.

Principles and production of conical roller bearings. Advantages and typical mountings in rolling mills. Diagrams.

**11340* Practical Experiences With New Bearings for Rotary Kilns.** (German.) F. Kaminsky. *Chemie-Ingenieur-Technik*, v. 26, no. 4, Apr. 1954, p. 202-205.

Development of spherical and surface-lubricated bearing pulleys. Photograph, graph, diagrams. 2 ref.

**11341 Lubricant Does Penetrate Wire Rope.** W. I. Lex. *Coal Age*, v. 59, May 1954, p. 97-99.

Includes graphs, photograph.

**11342* The Effect of Light Diesel Oil on High Speed Diesel Engines.** H. A. Havemann, M. R. K. Rao, and A. Natarajan. *Indian Institute of Science, Journal*, v. 36, sec. B, Apr. 1954, p. 59-79 + 5 plates.

Results show light oil leads to increased wear, ring sticking, valve burning, and pitting of valve seats. Cr plated top compression rings increase wear. Tables, diagram, photographs, graphs. 11 ref.

**11343 Neutral and Basic Sulfonates.** Hayward R. Baker, Curtis R. Singleterry, and Edwin M. Solomon. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 1035-1042.

Evaluation of neutral dinonyl naphthalene sulfonates as rust inhibitors in lubricating oils. Exploratory investigation of special properties of basic Ba soap as rust inhibitor in acid environments. Tables, graphs. 22 ref.

**11344* Redwood Lecture: The Friction of Non-Metallic Solids.** F. P. Bowden. *Institute of Petroleum, Journal*, v. 40, Apr. 1954, p. 89-101.

Theory of metallic friction; use of reflection electron microscopy; friction in plastics, brittle and elastic solids, ice, and solid Kr. Micrographs, graphs, tables, diagrams, photographs. 1 ref.

**11345* A Method for Approximate Determination of Viscosity-Pressure-Temperature Relationships for Oils. Results From an Investigation of Compressibility and Viscosity.** Sven Lundberg. *Institute of Petroleum, Journal*, v. 40, Apr. 1954, p. 104-115.

Includes diagrams, graphs, photographs, tables. 13 ref.

**11346 Molybdenum Disulfide Simplifies Extreme Pressure Lubrication Problems.** Alfred Sonntag. *Iron Age*, v. 173, May 20, 1954, p. 138-140.

Useful in combating galling and seizing of oxidation-resistant metals; lubricates successfully at very low and very high temperatures; is chemically inert. Graph, table. 3 ref.

**11347* Precision of Engine-Wear Investigation by the Method of Radioactive Tracers.** (Russian.) Iu. S. Zaslavskii, G. I. Shor, and F. B. Lebedeva. *Izvestiia Akademii Nauk SSSR, Otdelenie Teknicheskikh Nauk*, 1954, no. 1, Jan. 1, p. 54-60.

Simultaneous investigation on single-cylinder engine by radioactive tracers, weighing the piston ring, alveolar deposition on the piston ring, and plotting of a wear diagram on the basis of the amount of Fe in the lubricating oil. Graphs, tables, diagrams. 4 ref.

**11348* On the Temperature Difference Between Inner and Outer Races of Rolling Bearings.** (English.) Tokio Sasaki and Shigeru Ono. *Memoirs of the Faculty of Engineering, Kyoto University*, v. 16, no. 1, Jan. 1954, p. 9-13.

Confirms 5 C difference in inner and outer races. Speed has most effect. Graphs, tables, diagrams. 1 ref.

**11349 Economics of Thread Lubrication.** Jack C. Ballagh. *Petroleum Engineer*, v. 26, May 1954, p. B109-B114.

Problems involved in selection, purchase, and use of thread lubricants for industry. Diagrams, table.

**11350 The Influence of Oxide and Lubricant Films on the Friction and Surface Damage of Metals.** W. Hirst and

J. K. Lancaster. *Royal Society, Proceedings*, v. 223, ser. A, May 6, 1954, p. 324-338 + 1 plate.

Differences in protection given by different oxide films on same metal were noticed in presence of lubricant. Oxide film with poor protective properties can completely inhibit potential protection action of lubricant. Micrographs, graphs, tables. 18 ref.

**11351* Lubrication of Gears. IV. Manufacturers' recommendations.** *Scientific Lubrication*, v. 6, Apr. 1954, p. 10-12, 14.

Includes graphs, tables.

**11352* Turbine Oils and Turbine Lubricating Oil Systems. V. Laboratory Evaluation of Turbine Oils.** G. H. Clark. *Scientific Lubrication*, v. 6, Apr. 1954, p. 15-17.

Sampling, classification, neutralization value, viscosity, interfacial tension, sediment, and water.

**11353*** (Evaluating Bearing Materials. Derivation of Quality Value and Investigation of the Determining Magnitudes of Influence.) **Zur Bewertung der Lagerwekstoffe.** H. Stephan. *VDI Zeitschrift des Vereines deutscher Ingenieure*, v. 96, nos. 11-12, Apr. 15, 1954, p. 341-346.

Quality index, based on maximum stress a friction bearing can withstand; effects of operating conditions; dimensions on maximum stress. Diagrams, graphs, table. 18 ref.

**11354*** (Secondary Electron Diffraction by Fatty Layers on the Surface of Monocrystals.) **Diffraction électronique secondaire par des couches grasses a la surface de cristaux uniques.** Jean-Jacques Trillat and Claire Besse. *Vide*, v. 9, no. 49, Jan. 1954, p. 1446-1447.

Possibilities of studying structural molecular orientation and fundamental processes of lubrication. Micrographs, diagram.

***See also:***
**11207** (additives for lubricants)
**11449** (selecting materials for roller bearings—book)

## MECHANICAL ENGINEERING

**11355* Torsion of Cross-Braced Pyramidal Transmission Towers.** (English.) P. Csonka *Acta Technica Academiae Scientiarum Hungaricae*, v. 8, nos. 1-2, 1954, p. 25-36.

Mathematical analysis of bar forces and warping. Diagrams, table. 5 ref.

**11356* Stability of Beams of Rectangular Cross Section Suspended at Both Ends.** (German.) P. Csonka. *Acta Technica Academiae Scientiarum Hungaricae*, v. 8, nos. 1-2, 1954, p. 79-90.

Mathematical analysis of lateral buckling under uniformly distributed loading. Diagrams. 4 ref.

**11357* Scale Effect on Hydraulic Model Tests.** (French.) E. Mosonyi. *Acta Technica Academiae Scientiarum Hungaricae*, v. 8, nos. 1-2, 1954, p. 91-98.

Examination of hydraulic phenomena where several forces are acting.

**11358* A Contribution to the Theory of Orthotropic Plates.** (German.) Witold Nowacki. *Acta Technica Academiae Scientiarum Hungaricae*, v. 8, nos. 1-2, 1954, p. 109-128.

Greenian function derived where close form is used instead of infinite series. Diagrams, graphs.

**11359* The Engine Oil-Fed Torque Converter.** T. C. Gleason. *American Petroleum Institute, Proceedings*, sec. II. *Marketing*, v. 33, 1953, p. 60-67.

Uniting the torque converter and engine oil system simplifies results, permitting attachment of any type of geared transmission without provision for additional pump or sump capacity. Drawings, tables.

**11360 Measurement of Stresses Imposed on Wheels in Diesl-Locomotive Service.** L. L. Olson. *ASME, Transactions*, v. 76, May 1954, p. 613-616.

Objectives, test procedures, and instrumentation of proposed program to find causes for wheel failures. Photographs, diagrams.

**11361 Basic Features of Good Piston Design.** Frank Jardine. *Automotive Industries*, v. 110, May 1, 1954, p. 54-56, 106.

Data should aid engineers in future design. Graph, diagrams.

**11362 Machine Tool Engineers Analyze Future Automation Needs.** H. H. Roberts. *Automotive Industries*, v. 110, May 1, 1954, p. 62 + 4 pages.

Needs for reliability of control devices necessitates use of high quality equipment.

**11363*** (Turbocompressors.) **Turboverdichter.** E. Thomann. *Brennstoff-Wärme-Kraft*, v. 6, no. 4, Apr. 1954, p. 132-134.

Design and characteristics for compressing gases and metallurgical applications. Diagrams, graph. 5 ref.

**11364*** (Automatic Control.) **Regelungstechnik.** G. Wünsch. *Brennstoff-Wärme-Kraft*, v. 6, no. 4, Apr. 1954, p. 143-144.

Pneumatic and electrical controls; their applications. 15 ref.

**11365* The Theory of High Pressure Vessel Design.** B. A. Finlay. *Chemical & Process Engineering*, v. 35, May 1954, p. 147-150, 155.

Mathematical principles on which design is based; application in practice. Graphs, tables. 12 ref.

**11366*** (Measurement of Photoelastic Stresses.) **Jauge d'efforts photoélastique.** Roger Fleury and Félix Zandman. *Comptes rendus*, v. 238, no. 15, Apr. 12, 1954, p. 1559-1561.

Use of plastic photoelastic material permits direct outlining of stresses on surfaces. Graph.

**11367* Fluctuation Character of Establishing Vibration in an Autogenerator.** (Russian.) I. S. Gonorovskii. *Doklady Akademii Nauk SSSR*, v. 94, no. 5, Feb. 11, 1954, p. 869-872.

Analysis of special characteristics of vibration equipment on the assumption that initial conditions are exclusively of a fluctuation character. Graphs.

**11368*** (Certain Mechanisms in the Pneumatic Transport of Granular Materials Through Tubes.) **Nekotorye zakonomernosti pnevmaticheskogo transporta nasypnykh materialov po trubam.** A. E. Smoldyrev. *Doklady Akademii Nauk SSSR*, v. 95, no. 3, Mar. 21, 1954, p. 469-472.

Formula determines coefficient of resistance. Graphs. 12 ref.

**11369*** (Non-Stationary Motion of a Viscous-Plastic Liquid in a Cylindrical Tube of Circular Cross Section.) **Nestatsionarnoe dvizhenie viazko-plastichnoi zhidkosti v tsilindricheskoi trube kruglogo properechnogo secheniia.** A. Kh. Mirzadzhanzade. *Doklady Akademii Nauk SSSR*, v. 95, no. 5, Apr. 11, 1954, p. 947-950.

Formulation of a boundary problem with moving boundary. 16 ref.

**11370* Power Pump Efficency Gains With Pulsation Dampener Use.** Ray M. Brunton. *Drilling*, v. 15, May 1954, p. 74-75, 146-148.

Dampeners eliminate 95% of damaging pressure surges; save 60% on operating costs. Chart, oscillogram, photographs.

**11371* Pump Handling Systems.** *Flow*, v. 9, June 1954, p. 72-78.

Compilation of fluids and "fluidized" solids moved and metered by pump systems. Tables, photographs.

**11372 Piping, Pumps and Valves for Atomic Reactors.** Alfred Amorosi. *Heating, Piping & Air Conditioning*, v. 26, May 1954, p. 140-144.

Radioactivity problems of high-pressure, water-cooled nuclear plants; their effects on material selection and design of components. Diagrams, graphs, tables.

**11373* The Torsion of Solid Regular Hexagonal Shaft by Relaxation Methods.** B. V. Saroja. *Indian Institute of Science, Journal*, v. 36, sec. B, Apr. 1954, p. 37-42.

Mathematical determination of stress function in prismatic bar with uniform cross-section. Diagrams. 3 ref.

**11374* An Investigation of Small Helical Torsion Springs.** W. R. Berry. *Institution of Mechanical Engineers, Proceedings,*

## *Mechanical Engineering*

sec. A, v. 167, no. 4, 1953, p. 375-392; disc., p. 392-393 + 2 plates.

Validity of curvature correction to stress formula. Effects of variations in low-temperature heat treatment and wire size. Nomograms, tables, photographs, graphs. 7 ref.

**11375 Postbuckling Behavior of Axially Compressed Circular Cylindrical Shells.** Joseph Kempner. *Journal of the Aeronautical Sciences*, v. 21, May 1954, p. 329-335, 342.

Mathematical analysis of applied stresses. Graphs. 10 ref.

**11376 Process Control and Instrumentation. Recent Developments.** *Machinery Lloyd (Overseas Ed.)*, v. 26, Apr. 24, 1954, p. 116-120.

Control by console-desk and graphic methods. Photographs, diagram.

**11377 The Design of an Electro-Magnetic Clutch.** Raymond Brooke. *Machinery (London)*, v. 84, Apr. 23, 1953, p. 867-870.

Includes diagram, tables.

**11378 Evaluating Dynamic Performance of Feedback Control Systems.** T. A. Westover. *Mechanical Engineering*, v. 76, May 1954, p. 429-433. (Condensed from ASTM paper 53-A-129)

Equipment arranged and packaged as one convenient test instrument for servomechanisms. Diagrams, photograph, oscillograms. 2 ref.

**11379*** (Experimental Measurement of Torsion Vibrations. The Triangle Diagram.) **Contribution a la mesure expérimentale des vibrations de torsion.** Roger Fleury. *Métaux, Corrosion-Industries*, v. 29, no. 343, Mar. 1954, p. 105-110.

Method records vibrations of shaft or axle torsion. Photographs, graphs, diagrams.

**11380 The What, Why, and How of Pipe Line Centrifugal Pumps.** C. C. Keane. *Petroleum Engineer*, v. 26, May 1954, p. D121-D126.

Theory design, and application of centrifugal type pumps on pipe lines transporting crude oil and refined petroleum products. Diagrams, graph. 2 ref.

**11381 Forced-Torque Drive Systems.** Vincent R. Murphy. *Product Engineering*, v. 25, May 1954, p. 132-141.

Detailed analysis of basic circuit. Practical considerations in typical applications. Diagrams, photographs, graph.

**11382 Nonlinear Techniques in Design.** Sidney A. Davis. *Product Engineering*, v. 25, May 1954, p. 181-192.

Typical electrical and mechanical non-linearities. Two basic approaches to analysis and solution. Tables, diagrams. 5 ref.

**11383* Some Fundamental Principles of Noise Control. II. Methods of Noise Control.** Adone C. Pietrasanta. *Refrigerating Engineering*, v. 62, May 1954, p. 56 + 7 pages.

Choice and use of material for particular cases. Graphs, diagrams.

**11384 The Elastic Deformations of a Plate Near a Hole With a Stiffening Rim.** R. B. Harvey. *Royal Society, Proceedings*, v. 223, ser. A, May 6, 1954, p. 338-348.

Solution of equations of generalized plane stress obtained for plate under tension when a rim of material of different thickness is between two bounding curves. 8 ref.

**11385* Design-Production Gap Can Be Bridged.** R. J. Moran and Michael Field. *SAE Journal*, v. 62, May 1954, p. 25-28.

Abridged from "Manufacturing Methods Development—Bridging the Gap Between Engineering Design and Production" presented at SAE National Production Meeting, Chicago, Mar. 1954. Diagrams, photographs.

**11386* Designers Pick Up New Gear-Making "Steps".** W. E. Gustin and D. C. Smiley. *SAE Journal*, v. 62, May 1954, p. 60-63.

Abridged from "Engineering Evaluation of Gear Manufacturing Processes" presented at SAE Annual Meeting, Detroit, Jan. 12, 1954. Results of a recent engineering evaluation of gear-manufacturing processes. Photographs, graphs, tables.

**11387* Automatic High-Speed Injection Molding.** Ernest P. Moslo. *SPE Journal*, v. 10, May 1954, p. 12 + 5 pages.

Historical development of injection molding machines. Coordination of electricity, hydraulics, and mechanics of fully automatic machines. Photographs.

**11388* The Mechanics of Stress and Strain Occurring in a Fourdrinier Wire.** John D. Lyall. *Tappi*, v. 37, May 1954, p. 207-214; disc., p. 215-216.

Method calculates tensile and bending stresses induced in a single wire, at various positions around the Fourdrinier. Graphs, diagrams, photographs, tables. 9 ref.

**11389* Tolerances, Surface Roughness and Fitting Problems.** (Norwegian.) S. P. Andersen. *Teknisk Ukeblad*, v. 101, no. 15, Apr. 15, 1954, p. 349-356.

Modern macro- and micro-methods of measuring machined parts. Diagrams, graphs.

**11390* Preventing Press Failures, Maintenance and Operation.** A. F. Gagne, Jr. *Tool Engineer*, v. 32, June 1954, p. 54-58.

Preventive maintenance with detection and load control devices can usually prevent power-press smashups. Diagram, photographs.

**11391* Creativity in Design.** H. A. Oldenkamp and L. Strauss. *Tool Engineer*, v. 32, June 1954, p. 69-72.

Abstracted from paper 22T14 "Creativity in Mechanical Design," presented at 22nd ASTE Annual Meeting. Logic of machine design; principles of development to determine and analyze vital factors that influence success in design. Drawing, diagrams.

**11392*** (The "Two-Substance Two-Way Cooling". Prerequisites for Its Successful Use.) **Über die "Zweistoff-Zweiweg-Kühlung" beim Schleifen. Voraussetzungen für ihre erfolgreiche Anwendung.** G. Pahlitzsch and J. Appun. *VDI Zeitschrift des Vereines deutscher Ingenieure*, v. 96, nos. 11-12, Apr. 15, 1954, p. 320-328.

Grinding-wheel design passes lubricating oil radially from center to surface. Wheel is cooled externally by tangent application of an emulsion or water. Diagrams, table, graphs, photographs. 13 ref.

**11393* Centrifugal Pumps.** H. E. Beckwith. *Water & Sewage Works (Reference and Data Edition)*, v. 101, May 1954, p. R47-R50.

Notes on selection of pumps and checking pump efficiencies. Graph, tables.

**11394 High-Pressure Vessels Subjected to Static and Dynamic Loads.** E. D. Narduzzi and Georges Welter. *Welding Journal*, v. 33, May 1954, p. 230S-238S.

Elastic stress-strain relations for external and internal walls for cylindrical shells subjected to internal pressure. Comparison of actual stresses to theoretical stresses. Application of various theories of fracture. Suggestions for design formulas. Tables, graphs, diagrams, photographs. 7 ref.

**11395 Stresses for Pressure Vessels and Boilers Up to 650° F.** W. P. Kerkof. *Welding Journal*, v. 33, May 1954, p. 239S-251S.

Calculation and rupture theory for vessels subject to internal pressure. Tables, diagrams.

**11396* Wheel and Rocket Propulsion.** (German.) Eugen Sänger. *Zeitschrift für angewandte Mathematik und Physik*, v. 5, no. 2, Mar. 15, 1954, p. 164-167.

Efficiency at various velocities. Graphs.

**11397* Research on Glass Mercury Diffusion Pumps. II.** (German.) M. Reichardt. *Zeitschrift für angewandte Physik*, v. 6, no. 3, Mar. 1954, p. 104-108.

Optimum dimensions and design of single- and triple-stage pumps. Diagrams, graphs. 7 ref.

*See also:*
**10790** (design of distillation equipment)
**10792** (boiling of liquids)
**10886** (leather seals and packings)
**11040** (design of automatic equipment)
**11278** (cavitation in boiler-feed pumps)
**11477** (purification by zonal melting)
**11787** (managing the automobile plant)
**12023** (paper making machines)

## METALLURGY

**11398 The Transition Metals and Their Alloys.** W. Hume-Rothery and B. R. Coles. *Advances in Physics*, v. 3, Apr. 1954, p. 149-242.

Physical properties, atomic and co-valent radii, electro theory, alloys with Al, and electronic structures. Graphs, tables, diagrams. 136 ref.

**11399 1.5 Per Cent Carbon Cast-Steel Railroad-Car Wheels.** N. A. Matthews and R. A. Flinn. *ASME, Transactions*, v. 76, May 1954, p. 617-621.

Cast steel found superior to chilled Fe for wheels subjected to severe operating conditions. Micrographs, diagram, tables.

**11400*** (Working and Processing of Aluminum.) **Be- en ver- werking van aluminium.** Ir. A. Jager. *Bedrijf en Techniek*, v. 9, no. 200, Apr. 24, 1954, p. 199-203.

Properties and use of various alloying elements for different applications. Table.

**11401*** (Materials for High Steam Temperatures.) **Werkstoffe für hohe Dampftemperaturen.** K. Wellinger. *Brennstoff-Wärme-Kraft*, v. 6, no. 4, Apr. 1954, p. 144-145.

Application of special steels to boiler construction. Methods for determining their strengths at wall temperatures above 575 C. Graph. 19 ref.

**11402 Metal Canada. I.** H. McLeod. *Canadian Metals*, v. 17, May 1954, p. 8 + 10 pages.

Annual review of metalworking industry in Canada. Tables.

**11403 High Alloy Casting.** *Canadian Metals*, v. 17, May 1954, p. 26-27.

Alloys with properties favorable to rigorous conditions of high temperature and pressure. Photographs.

**11404*** (Problem of the Compound $Ni_2Cr$.) **K voprosy o soedinenii $Ni_2Cr$.)** I. I. Kornilov and R. S. Mints. *Doklady Akademii Nauk SSSR*, v. 95, no. 3, Mar. 21, 1954, p. 543-545.

Micro-structural analysis, electric-resistance, dilatometry, and X-ray phase analysis. Table, graphs. 6 ref.

**11405* Some Early Goldwork.** Charles Singer. *Endeavour*, v. 13, Apr. 1954, p. 86-93.

Early surviving pieces indicate a high degree of craftsmanship and wide empirical knowledge of physical properties of Au. Drawings, maps, photographs.

**11406* Steel Wire Ropes—Their Construction and Application.** F. J. Hewitt. *Institution of Engineers & Shipbuilders in Scotland, Transactions*, v. 97, pt. 6, 1953-54, p. 471-482; disc., p. 483-488.

Quality of wire used in rope making, construction and fabrication of ropes, lubrication, and corrosion resistance in relation to requirements. Diagrams.

**11407* Steels for Steam Power Plant.** A. M. Sage. *Institution of Mechanical Engineers, Proceedings*, sec. A, v. 167, no. 4, 1953, p. 414-424; disc., p. 424-433.

Creep properties in different steels led to adoption of Cr-Mo, and Cr-Mo-Si and, to a less extent, Mo-V steel for components in plant using temperatures above 900 F. Future developments are outlined. Graphs, tables, micrographs. 16 ref.

**11408 Nodular Cast Iron.** S. B. Bailey. *Iron & Steel*, v. 27, May 1954, p. 193-196.

Present position; future prospects of economic and engineering developments. Graphs, table.

**11409* Manganese-Titanium Carburized Economy Steels.** (Hungarian.) Nándor Hajtó. *Kohászati Lapok*, v. 9, no. 2, Feb. 1954, p. 59-68.

Effect of Ti on various steels made with Hungarian alloying elements. Mechanical properties and results of case hardening. Tables, graphs. 10 ref.

**11410* The Application of Thermodynamic Functions to Metallurgy. II.** (Hungarian.) Aurél Horváth. *Kohászati Lapok*, v. 9, no. 3, Mar. 1954, p. 109-114.

Variation of entropy function with volume, pressure, and temperature. Application to problems. Tables.

**11411* Drop-Forged Steels. I. The Role of Alloying Metals in Drop-Forged Steels.** (Hungarian.) Ernó Weigl. *Kohászati Lapok*, v. 9, no. 3, Mar. 1954, p. 122-129.

Role of Ni, Mn, Cr, W, and Mo. Types of steel, composition, heat treatment, and applications. Graphs, table.

**11412 Titanium.** Harry S. Brenner. *Machine Design*, v. 26, May 1954, p. 136-140.

Steady development promises widespread commercial application. Photographs.

**11413 Heavy Metals.** Don Wackerle. *Machine Design*, v. 26, May 1954, p. 143-147.

Uses and fabrication of high density alloys by powder metallurgy. Photographs, graphs, table.

**11414 Temperature-Compensator Alloys.** Warren S. Eberly. *Machine Design*, v. 26, May 1954, p. 152-156.

Provide automatic temperature correction for magnetic and electrical properties in instrumentation devices. Photograph, tables, graphs, diagram.

**11415 Zirconium.** John D. Roach. *Machine Design*, v. 26, May 1954, p. 156-158.

Properties and uses of this high strength, low density, noncorrosive metal. Photographs, tables.

**11416 Beryllium.** Gordon F. Simons and Simon J. Morana. *Machine Design*, v. 26, May 1954, p. 176-180.

Suggests other properties and applications of Be beside its use in Be-Cu. Tables, graph, micrographs. 5 ref.

**11417 Directory of Materials. 18th Ed.** *Machine Design*, v. 26, May 1954, sec. 2, p. 1-204.

Trade names, producers, specifications, and information on ferrous and non-ferrous metals, non-metallic materials, and finishes and coatings.

**11418* Titanium Weldment Replaces Steel Mortar Baseplate.** C. Hartbower. *Machinery*, v. 60, May 1954, p. 182-184.

Weight and strength advantages. Tables, photographs.

**11419 Titanium, Companion-Metal to Magnesium.** *Magnesium*, 1954, May, p. 12-16.

Uses and properties. Development of deep drawing. Photographs, table, graph.

**11420 The Metallurgy of Titanium and Zirconium.** W. J. Kroll. *Metal Industry*, v. 84, Apr. 23, 1954, p. 325-327; May 7, 1954, p. 401-403.

Critical review of existing patents. Behavior of both metals at high temperature, under various conditions of exposure. Diagrams, tables. 41 ref.

**11421 The Aluminium Industry in Great Britain.** E. G. West. *Metal Industry*, v. 84, Apr. 30, 1954, p. 345-348.

Present capacities and general trends. Photographs.

**11422 The Precious Metals Industry.** L. B. Hunt. *Metal Industry*, v. 84, Apr. 30, 1954, p. 353-356.

Industrial use of Ag, Pt, and the Pt metals. Photographs.

**11423 The British Copper Industry.** E. Voce. *Metal Industry*, v. 84, Apr. 30, 1954, p. 357-359.

Reviews present production facilities and mineral sources. Photographs.

## *Metallurgy*

**11424*** (Titanium.) **Titan.** A. Von Zeerleder. *Metall*, v. 8, no's. 9-10, May 1954, p. 347-351.

Historical review. Reduction of Ti compounds, current research, properties, and application. Diagrams, tables. 14 ref.

**11425*** (Aluminum as a Material in Modern Bridge Building.) **Aluminium als Wekstoff in neuzeitlichen Brückenbau.** W. Bleicher. *Metall*, v. 8, no's. 9-10, May 1954, p. 358-362.

Mechanical properties of Al-Mg-Si alloy. Photographs, diagrams. 7 ref.

**11426 Metallurgy at Los Alamos 1943-1945.** Cyril Stanley Smith. *Metal Progress*, v. 65, May 1954, p. 81-89.

Non-technical discussion on development of Pu metallurgy. Graphs, table, photographs.

**11427 Materials for Large Army Gun Tubes. A History. I. Cast Iron.** Peter R. Kosting. *Metal Progress*, v. 65, May 1954, p. 90-95, 152, 154.

Methods of casting and testing in 19th century. Diagrams, tables. 18 ref.

**11428 Current Russian Metallurgical Texts. IV.** Carl Andrew Zapffe. *Metal Progress*, v. 65, May 1954, p. 125 + 5 pages.

Critical review of seven technical books.

**11429 Titanium-Silicon Alloys.** D. A. Sutcliffe. *Metal Treatment and Drop Forging*, v. 21, Apr. 1954, p. 191-197.

Effect of Si on physical properties and solid solubility limits of arc melted binary Ti alloys containing up to 5.5% Si by weight. Tables, photograph, diagram, graphs, micrographs. 10 ref.

**11430 Department of Metallurgy at the University of Cambridge.** G. Wesley Austin. *Metal Treatment and Drop Forging*, v. 21, May 1954, p. 215-223.

Facilities for teaching and research; resumé of research work in progress. Photographs.

**11431* Péchiney Beryllium Copper.** *Microtecnic (English Ed.)*, v. 8, no. 1, 1954, p. 43-50.

Physical, mechanical, and chemical properties; machining; and applications. Diagrams, tables, graph.

**11432* The First Century: Aluminum in France.** *Modern Metals*, v. 10, May 1954, p. 82-84, 86.

Historical review. Photographs, graph, map.

**11433* Bessemer Oxygen Steels. Their Industrial Production and Fields of Application.** (French.) Jean Wurth. *Ossature métallique*, v. 17, no. 4, Apr. 1954, p. 205-224.

Properties and advantages. Graphs, photographs, tables. 9 ref.

**11434*** (Steel Radiators.) **Le radiateur en acier.** J. Reniers. *Ossature metallique*, v. 19, no. 5, May 1954, p. 257-270.

Production characteristics and application of section and panel radiators. Diagrams, photographs.

**11435* Aluminum Alloys in Hopper Cars.** E. T. Englehart and G. B. Hauser. *Railway Locomotives and Cars*, v. 128, May 1954, p. 62-66.

Appraisal of results from 75 experimental cars and 11 owners in different classes of service. Photographs, tables.

**11436 Industry Leans Heavily on Light Metals.** *Steel*, v. 134, May 10, 1954, p. 118-120.

Includes "Cheaper Magnesium Mill Products", W. H. Gross and P. L. Filter; "Higher Strength Aluminum Alloys", Bruce E. Brennan; "Aluminum Design Tips", J. R. Willard; "Promising Al-Mg Alloys", J. R. Young; and "Magnesium Tops for Deep Draws", J. S. Kirkpatrick. Photographs.

**11437 Now You Can Use Titanium.** C. I. Bradford. *Steel*, v. 134, May 10, 1954, p. 148-150.

As mass production lowers cost, non-defense users will use more. Characteristics are presented. Table, photographs. (To be continued.)

**11438 Cast Alloys Tops for Hot Spots.** E. A. Schoefer. *Steel*, v. 134, May 24, 1954, p. 122-125.

Lists cast alloys or combination that can handle high-temperatures. Tables, photographs.

**11439* The Iron Plantation.** Arthur C. Bining. *Steelways*, v. 10, June 1954, p. 4-7.

Fe was once produced on plantations. Their growth and decline traced from colonial times to late in nineteenth century. Drawings, photographs.

**11440* Tin Compounds and Alloys.** Ernest S. Hedges. *Times Review of Industry*, v. 8, new ser., May 1954, p. 24-25.

Outlets recently developed in plastics, pestology, and metallurgy. Photographs.

**11441* Cerium, Cerium Alloys, and Cerro Alloys.** (German.) Bruno Waeser. *Werkstoffe und Korrosion*, v. 5, no. 4, Apr. 1954, p. 137-138.

Use of Ce in production and working of spheroidal cast iron as a protective agent and catalyst. Properties of Cerrobase, Cerrobend, Cerromatrix, and Cerrotru alloys. Tables. 16 ref.

### *Books and Miscellaneous Publications*

**11442 Materials for Product Development 1953.** 265 p. 1953. Clapp & Poliak, Inc., N. Y. (TA403 M41.3).

Proceedings of the Basic Materials Conference and First Basic Materials Exposition, New York, June 1953. Covers engineering materials economics; high strength with low weight; high- and low-temperature service; atomic energy; electrical and electronic service; materials selection. Papers individually abstracted.

**11443 Effecting Economies With High-Strength Steels.** A. F. Stuebing. Paper from MATERIALS FOR PRODUCT DEVELOPMENT 1953. p. 73-82. Clapp & Poliak, Inc., N. Y. (TA403 M41.3)

Cites examples in many forms of heavy equipment.

**11444 Titanium.** George T. Fraser. Paper from MATERIALS FOR PRODUCT DEVELOPMENT 1953. p. 85-93. Clapp & Poliak, Inc., N. Y. (TA403 M41.3)

Fabrication, forming, applications, and economics. Photographs, graph, tables.

**11445 Materials for High-Temperature Service.** Howard C. Cross. Paper from MATERIALS FOR PRODUCT DEVELOPMENT 1953. p. 117-144; disc., p. 159-161. Clapp & Poliak, Inc., N. Y. (TA403 M41.3)

Plastics in aircraft applications; progress of the newer metals, Al, Ti, Cr, Mo; and ceramics. Graphs, tables.

**11446 Materials for Low-Temperature Service.** Francis B. Foley. Paper from MATERIALS FOR PRODUCT DEVELOPMENT 1953. p. 144-159; disc., p. 159-161. Clapp & Poliak, Inc., N. Y. (TA403 M41.3)

Various aspects of selection, design, and testing of metals for service down to −328 F. Diagrams, graphs, tables.

**11447 Materials and the Atomic Age.** J. C. Robinson. Paper from MATERIALS FOR PRODUCT DEVELOPMENT 1953. p. 162-170; disc., p. 170-172. Clapp & Poliak, Inc., N. Y. (TA403 M41.3)

A popular review of secondary aspects and possibilities of U.S.A.E.C. work, especially with Zr, Hf, and Be.

**11448 Magnetic Materials.** Eberhard Both. Paper from MATERIALS FOR PRODUCT DEVELOPMENT 1953. p. 199-221; disc., p. 221-222. Clapp & Poliak, Inc., N. Y. (TA403 M41.3)

Properties of new materials and their applications. Magnetic properties explained. Photograph, graphs. 14 ref.

**11449 Selecting Materials for Roller Bearings.** Theodore Jagen. Paper from MATERIALS FOR PRODUCT DEVELOPMENT 1953. p. 251-255. Clapp & Poliak, Inc., N. Y. (TA403 M41.3)

Demands close cooperation between several management groups to improve and reduce cost of bearings. Permanent committee studies materials and methods.

*See also:*
**10722** (uses of graphite in metallurgical industries)

## METALS—EXTRACTION AND REFINING

**11450* Experimental Manufacture of Spheriodal Graphite Chilled Iron Rolls in Hungary.** (Russian.) B. Korös. *Acta Technica Academiae Scientiarum Hungaricae*, v. 8, nos. 1-2, 1954, p. 36-66 + 4 plates.

Four series of tests on production methods. Micrographs, tables, diagram, graphs. 37 ref.

**11451 The Use of Oxygen in the Iron and Steel Industry. Steelmaking in the Converter Using Oxygen. II.** Georg Bulle. *Blast Furnace and Steel Plant*, v. 42, May 1954, p. 531-536.

Definite advantages with increased production. Diagrams, photograph.

**11452 Strategic Metal Out of the North.** *Canadian Chemical Processing*, v. 38, Apr. 1954, p. 52, 54, 56.

Equipment, plant layout, and processing techniques of Canada's Cobalt Chemicals, Ltd. Photographs, flow sheet.

**11453* Non-Manganese and Semi-Manganese Pig Irons. Technical and Economic Comparison of Use in Basic Bessemer Converter.** (French.) Rajon and Tavard. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques*, v. 11, 1954, no. 3, p. 549-560.

Studies ordinary steels prepared by addition of ferro-manganese with 75% Mn. Effect of consumption of ferro-manganese, lime, scrap, $Na_2Co_3$, and pig iron on linings. Shows influence of increase of Mn content in pig on quality of steel. Graphs, tables.

**11454*** (Committee of Engineers for Basic Bessemer and Other Furnaces. Storage Tests in Cowper Apparatus.) **Commission d'ingénieurs des hauts fourneaux Thomas et autres que Thomas. Essais d'accumlation dans les appareils Cowper.** *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques*, v. 11, no. 4, 1954, p. 721-734.

Results of tests on Brohlthal and Petit á Senelle Cowpers. Graphs, tables, diagrams.

**11455*** (Committee of Engineers for Basic Bessemer Steel Mills.) **Commission d'ingénieurs des acieries Thomas. I.** (Oxygen-Enriched Blasting Tests at Moyeuvre.) **Essais de soufflage au vent enrichi en oxygène a moyeuvre.** Trentini. **II.** (Mechanism of the Fertilizing Action of Basic Bessemer Slags.) **Mécanisme de l'action fertilisante des scories Thomas.** Barbier. **III.** (Dilling's Tests on Oxygen-Enriched Blasts.) **Essais de Dilling sur le soufflage a l'air enrichi a l'oxygène.** Buey. **IV.** (Some Remarks on the Production of Converter Bottoms.) **Quelques considérations sur la fabrication des fonds de convertisseurs.** Delong. *Centre de Documentation Sidergique, Circulaire d'Informations Techniques*, v. 11, no. 4, 1954, p. 753-769.

Industrial possibilities offered by enriched blast. Tables, graphs, photographs.

**11456*** (Committee of Engineers for Open-Hearth Furnaces. Control of Slag in the Basic Open-Hearth Furnace.) **Commission d'ingénieurs des aciéries Martin. Controle des laitiers au four Martin basique.** Bernard. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques*, v. 11, no. 4, 1954, p. 771-778.

Relationship between composition of slag; elimination of C, P, and S; and recovery of Mn.

**11457 Thorium and Rare Earths From Monazite.** A. E. Bearse, G. D. Calkins, J. W. Clegg, and R. B. Filbert, Jr. *Chemical Engineering Progress*, v. 50, May 1954, p. 235-239.

Shows advantages to sulfuric acid process now used by rare earths industry in U.S. Tables, photographs, diagram. 4 ref.

**11458* Production of Germanium.** (German.) W. Schreiter. *Chemische Technik*, v. 6, no. 3, Mar. 1954, p. 141-148.

Discovery, natural resources, properties; extraction from ores, flydust, and coal; and uses in electronic equipment. Tables, photographs. 29 ref.

**11459*** (Electrolysis of Liquid Iron Containing Slags.) **Elektroliz zhidkikh zhelezistykh shlakov.** O. A. Esin and P. M. Shurygin. *Doklady Akademii Nauk SSSR*, v. 94, no. 6, Feb. 21, 1954, p. 1145-1147.

Method of cathodic reduction. Diagrams, graph. 7 ref.

**11460*** (Influence of Gaseous Medium on the Sinterability of Chromic Oxide.) **Vliianie gazovoi sredy na spekalmost' okici khroma.** P. P. Budnikov and S. G. Tresviatskii. *Doklady Akademii Nauk SSSR*, v. 95, no. 5, Apr. 11, 1954, p. 1041-1042.

Preparation in protective atmospheres of N, A, or a vacuum. Table. 5 ref .

**11461*** (Solubility of Iron in Liquid Slags.) **O rastvorimosti zheleza v zhidkikh shlakakh.** P. M. Shurygin and O. E. Esin. *Doklady Akademii Nauk SSSR*, v. 95, no. 5, Apr. 11, 1954, p. 1043-1045.

True solution of Fe in oxide slags is shown by formation of Au-Fe alloys when a drop of Au is introduced into molten $FeO$-$Fe_2O_3$ mixture in magnesite crucibles.

**11462 Iron and Steel Making Processes Used in Sweden.** Sven Fornander. *Iron and Steel Institute, Journal*, v. 177, May 1954, p. 1-12.

Processes for making of pig iron, sponge iron, and ingot steel. Emphasis on scarcity of fossil fuel and relatively large resources of hydro-electric power. Maps, graphs, photograph, tables, diagrams. 56 ref.

**11463 Reduction of Iron Ore Without Melting in a Rotary Furnace.** Bo Kalling and Folke Johansson. *Iron and Steel Institute, Journal*, v. 177, May 1954, p. 76-85.

Construction and results of new type furnace; possibilities in steel making. Diagrams, photographs, tables. 6 ref.

**11464 Pearlite-Free Basic Bessemer Steel: Its Fabrication and Properties.** Ake Josefsson. *Iron and Steel Institute, Journal*, v. 177, May 1954, p. 118-128 + 1 plate.

Easily and economically produced. Impact tests on plates and bend tests on welded specimens. Tables, graphs, diagram, micrographs, photographs. 11 ref.

**11465 Electric Furnace Operation.** F. S. Leigh. *Iron & Steel*, v. 27, May 1954, p. 169-174.

Trends in modern design. Considers electrodes, fume disposal, magnetic stirrer, and special-purpose furnaces. Photographs, diagrams, oscillogram.

**11466* Investigation of the Distribution of Gaseous Flow in a Blast Furnace Using a Model.** (Russian.) N. N. Chernov. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk*, 1954, no. 1, Jan. 1, p. 80-91.

Design of model; method of study on experimental installations. Tables, diagrams, graph. 3 ref.

**11467 Production of Rare Earth Metals in Quality Allows Testing of Physical Properties.** F. H. Spedding and A. H. Daane. *Journal of Metals*, v. 6, May 1954, p. 504-510.

Preparation of kg. quantities of high purity La, Ce, Pr, and Nd. Unsuccessful attempts to prepare Y, Sm, and Gd. Apparatus, techniques, and problems encountered. Properties of prepared metals. Photograph, diagram, tables, graphs. 17 ref.

**11468 Copper Slabs Weighing 3000 Lb Successfully Cast at Raritan Works.** C. D. Pearce. *Journal of Metals*, v. 6, May 1954, p. 512-514.

Equipment, plant layout, and operating procedures. Photographs, tables.

**11469 Effect of Si, Mn, P, Al, C, Ni, and Cu on the Mechanism of Sulphur Transfer Across a Slag-Metal Interface.** K. M. Goldman, G. Derge, and W. O. Philbrook. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 534-540.

Study of kinetics and mechanism of S transfer at slag-metal interface under specified laboratory control. Graphs, tables, diagram, micrographs. 16 ref.

**11470 Mechanism and Rate-Controlling Factors in the Dissolution of Gold in Cyanide Solution.** V. Kudryk and H. H. Kellogg. *Journal of Metals*, v. 6; *American Institute of*

## *Metals—Extraction and Refining*

*Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 541-548.

Factors controlling rate of dissolution of pure Au in cyanide solution, studied directly and by measurement of current-potential curves for anodic and cathodic portions of reaction. Diagrams, graphs. 14 ref.

**11471*** **Production of Electrolytic Manganese.** N. Dhananjayan, H. K. Chakrabarti, and T. Banerjee. *Journal of Scientific & Industrial Research*, v. 13, sec. A. Feb. 1954, p. 136-144.

Electrolysis of solution containing $MnSO_4$, $NH_3$, and $SO_2$, in canvas diaphragm cell employing stainless steel cathode and Pb anodes. Graphs, tables, diagram. 20 ref.

**11472*** **Some Simple Investigations Concerning Foaming of Unfiltered Aluminate Liquor in Alumina Plants.** (Hungarian.) Mihály Máriássy, Veronika H. Borsiczky, and István Somogyi. *Kohászati Lapok*, v. 9, no. 2, Feb. 1954, p. 73-75.

Experiments to determine causes. Tables. 2 ref.

**11473*** **The Manufacture of Aluminum-Copper-Magnesium Plate. II.** (Hungarian.) E. István Boczor. *Kohászati Lapok*, v. 9, no. 2, Feb. 1954, p. 85-91.

Details of manufacturing process. Graphs, diagrams, tables. 9 ref.

**11474*** **Energy Problem in the Electrolytic Reduction of Alumina. I-II.** (Hungarian.) Arisztid Czeke. *Kohászati Lapok*, v. 9, no. 3, Mar., p. 133-144; no. 4, Apr. 1954, p. 178-183.

Analytic method shows 13 to 15% of power could be saved with better construction and operation of Söderberg electrolytic cell. Losses caused by resistance of the electrolyte; voltage occurring during contact of molten Al and electrolyte; and possibilities for decreasing power requirements. Diagram, tables, graphs, nomogram. 8 ref.

**11475*** **Problems of Solidification and Segregation in Killed and Unkilled Steels.** (Italian.) Bernhard Matuschka. *Metallurgia italiana*, v. 46, no. 2, Feb. 1954; *Atti notizie (AIM)*, v. 9, no. 2, Feb. 1954, p. 50-58; disc., p. 58-60.

Study of ingot defects and their control. Graphs, photographs, micrographs, diagrams.

**11476*** **Problems of Pig Iron Production.** (German.) S. Henkel. *Metallurgie und Giesserei Technik*, v. 4, no. 3, Mar. 1954, p. 101-105.

Bloomery process preferred for smelting low-grade acid-ores over low-shaft furnace for greater economy and lower coke consumption. Tables, diagrams. 22 ref.

**11477** **Fractional Fusion.** C. H. L. Goodman. *Research*, v. 7, May 1954, p. 168-177.

Techniques for purification and homogenization of materials by zonal melting. Possible applications. Graphs, diagrams. 6 ref.

**11478** **Floating Zone Recrystallization of Silicon.** P. H. Keck, W. Van Horn, J. Soled, and A. MacDonald. *Review of Scientific Instruments*, v. 25, Apr. 1954, p. 331-335.

Equipment to carry out recrystallization and zone melting. Single crystals of resistivities up to several hundred ohm cm. have been grown. Photographs, diagrams. 5 ref.

**11479*** (The Investigation of Heterogeneity of Forging Ingots.) **Contribution a l'étude de l'hétérogénéité des lingots de forge.** M. Nepper. *Revue universelle des mines*, v. 10, ser. 9, no. 4, Apr. 1954, p. 96-99.

Relationship between shape and degree of heterogeneity established in 20 ton Bessemer C steel ingots. Table, photographs, diagrams.

**11480*** (Using Sulfur Monochloride $S_2Cl_2$ for the Manufacture of Light Metal Alloys and for Processing Aluminum Scrap.) **Pouziti chloridu sirného $S_2Cl_2$ pri vyrobe lehkych slitin a zpracování hliníkovych odpadu.** Zdenek Eminger. *Slévárenství*, v. 2, no. 1, Jan. 1954, p. 11-14.

Eliminates Mg from the melt. Diagrams. 3 ref.

**11481*** (The Oxygen Contents of Molten Steels From the Basic Converter, Open-Hearth, and Electric Furnace.) **Die Sauerstoff-gehalte flüssiger Thomas-, Siemens-Martin- und Elektrostähle.** Karl Georg Speith and Hans vom Ende. *Stahl und Eisen*, v. 74, no. 9, Apr. 22, 1954, p. 509-525.

Steel blown with air, 30% O, and pure O. Dependence on composition of slag and alloy content. Graphs, tables. 83 ref.

**11482*** (Repair of Basic Open-Hearth Furnaces With Machines.) **Maschinelles Flicken von Siemens-Martin Ofen. I.** (Patching With Blaw-Knox-Machines.) **Das Flicken Mit der Blaw-Knox-Maschine.** Wolfgang Schleicher. **II.** (Operation of Brieden Type Dolomite Guns.) **Die Arbeitsweise des Dolomitbläsers, Bauart Brieden.** Ewald Friemann and Günther Evers. **III.** (The BRI Dolomite Sprayer.) **Die Dolomitspritze BRI.** Max Hauck. **IV.** (Repairing With the Blaw-Knox Machine.) **Flicken mit der Blaw-Knox-Maschine.** Heinrich Cless. *Stahl und Eisen*, v. 74, no. 10, May 6, 1954, p. 620-623.

Includes photographs, diagram, table.

**11483*** (Reconstruction of Four Blast Furnaces in the Salzgitter Smelting Plant.) **Der Umbau von vier Hochöfen beim Hüttenwerk Salzgitter.** Wilhelm Ingenerf. *Stahl und Eisen*, v. 74, no. 10, May 6, 1954, p. 649-651.

Changes during repair of American designed furnaces. Diagrams, photograph.

**11484** **Correlating Blast Furnace Operating Concepts.** Charles Agnew. *Steel*, v. 134, May 17, 1954, p. 106 + 4 pages.

Generation, distribution, recovery, and use of heat important factors governing proper coke combustion. Table, photographs. 4 ref.

**11485*** (Inhibiting Influence of Gaseous Reaction Products on the Velocity of Reduction of Iron Oxides by Hydrogen and Carbon Monoxide.) **Zamedliaiushchee vliianie gazoobraznykh produktov reaktsii na skorost' vosstanovleniia okislov zheleza vodorodm i okis'iu ugleroda.** G. I. Chufarov, B. D. Averbukh, E. P. Tatievskaia, and V. K. Antonov. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 3, Mar. 1954, p. 490-497.

Experiments show good accord with data on adsorption of reducing gases and reduction products. Graphs. 7 ref.

**11486*** **Behavior of Arsenic and Antimony During Electrolytic Refining of Copper.** (Russian.) L. Ia. Livshits and V. A. Pazukhin. *Zhurnal Prikladnoi Khimii*, v. 27, no. 3, Mar. 1954, p. 298-309.

Electrodeposition observed only when current density exceeds 300 amp. per $m^2$. Tables, graphs. 18 ref.

**11487*** (Electrolytic Preparation of Ternary Alloys of Nickel With Iron and Molybdenum.) **Elektroliticheskoe poluchenie troinykh splavov nikelia s zhelezom i molibdenom.** T. F. Frantsevich-Zabludovskaia, I. N. Frantsevich, and K. D. Modylevskaia. *Zhurnal Prikladnoi Khimii*, v. 27, no. 4, Apr. 1954, p. 413-420.

Influence of concentration of a neutral salt on change of electrolytic composition during electrolysis. Tables, graphs, micrographs. 20 ref.

***See also:***
**10717** (linings for steel furnaces)
**10749** (utilization of quartz bricks and blocks)
**11729** (reduction of Ni ore)
**11817** (direct smelting of iron ore)

## METALS—FINISHING, POLISHING, AND CLEANING

**11488*** **Testing Pickling Additions for Their Effectiveness.** (German.) Hubert Hoff and Georg von der Dunk. *Archiv für das Eisenhüttenwesen*, v. 25, nos. 3-4, Mar.-Apr. 1954, p. 115-123.

Process determines inhibiting effect, stability, and effects of time and dissolved Fe on different inhibitors. Photographs, graphs, tables. 23 ref.

**11489*** **Rusty Stock Reclaimed.** C. N. Calvin. *Bureau of Ships Journal*, v. 3, May 1954, p. 32-34.

Six minutes in "Tumblast" and unfit-for-issue stock looks brand new. Photographs.

**11490 Abrasive Finishing.** Gilbert C. Close and R. Stanley Burt. *Finish*, v. 11, June 1954, p. 24-27.

Compounds, equipment, and techniques employed for lapping metal surfaces. Diagrams, photographs.

**11491*** (Examination of Superfinish Mechanism in the Electron Microscope.) **Examen au microscope électronique du mécanisme du superfini.** Noboru Takahashi and Toshio Asaeda. *Métaux, Corrosion-Industries*, v. 29, no. 343, Mar. 1954, p. 95-99.

Studies of ground and superfinished high Cr and C steels. Graphs, micrographs. 4 ref.

**11492* How to Clean Titanium Sheet for Spot Welding.** E. R. Funk. *Modern Metals*, v. 10, May 1954, p. 70, 72-73.

Effective descaling procedure. Diagram, graph, photograph.

**11493*** (Burning Out Defects in Steel Castings by Carbon Electrode.) **Odstranování vad ocelových odlitků uhlíkovou elektrodou.** Karel Malý. *Slévárenství*, v. 2, no. 2, Feb. 1954, p. 51-53.

Mechanical cleaning in preparation for welding of defects. Efficiency of method. Photographs.

**11494* Chrome Plating of Cutting Tools.** (Russian.) M. I. Andrianov. *Stanki i Instrument*, v. 25, no. 2, Feb. 1954, p. 21-23.

Plating surface preparation. Diagrams.

**11495 The Applications of Blast Cleaning in Steel Processing. III.** Victor F. Stine. *Steel Processing*, v. 40, May 1954, p. 307-311.

Non-metallic and metallic abrasives with production equipment used for testing cleaning methods. Photographs.

***See also:***
**10939** (surface active materials for metal cleaning)

## METALS—FOUNDRY PRACTICE

**11496* The Influence of Mould Factors on Casting Defects.** J. H. Gittus. *British Cast Iron Research Association. Journal of Research and Development*, v. 5, Apr. 1954, p. 264-277 + 1 plate.

Effects of dimensions and composition of metal and mold on change in length of test castings during solidification. Diagrams, graphs, tables, photograph. 14 ref.

**11497* Behaviour of Sand Mixtures Under Load at Room and Elevated Temperatures.** R. G. Godding and R. Rew. *British Cast Iron Research Association. Journal of Research and Development*, v. 5, Apr. 1954, p. 278-295 + 4 plates.

Apparatus designed and constructed to obtain stress-strain curves on dried compression test pieces of molding sand. Graphs, diagrams, tables, photographs.

**11498 Foundry Uses of Carbon and Graphite.** E. R. Landry. *Canadian Metals*, v. 17, May 1954, p. 28, 30, 32.

Ferrous and non-ferrous foundry applications of carbon and graphite, based on singular combination of chemical, physical, and electrical properties.

**11499* Improving Permeability of Fine Sand by Addition of Large-Grain Sand.** (French.) Pierre Nicolas. *Fonderie*, 1954, Mar., no. 98, p. 3872-3873.

Shows practice to be unsound. Tables, charts.

**11500 Running and Feeding of Sand Castings.** R. W. Ruddle. *Foundry Trade Journal*, v. 96, Apr. 29, 1954, p. 489-495; disc., p. 495-497.

Technology of feeders, chills, gates. Diagrams, table. 14 ref.

**11501 Synethetic Resins in Core-Bonding.** W. Andrews. *Foundry Trade Journal*, v. 96, May 6, 1954, p. 521-524; disc., p. 524-527.

Summarizes outstanding features of resin core-binders. Graphs, table.

**11502 Steelmaking for the Steel Foundry.** J. Blackburn. *Foundry Trade Journal*, v. 96, May 13, 1954, p. 549-557.

Melting units with their advantages. Processes and procedures of temperature measurement and control and pouring. Photographs, table, diagram, graph.

**11503* Plant Experiences With Hot-Blast Cupola Furnace of Esslingen Design.** (German.) H. Kopp. *Giesserei*, v. 41, no. 8, Apr. 15, 1954, p. 186-193.

Advantages of hot-blast melting are utilized without preheating. High efficiency, shown by waste-gas tests and lower coke consumption, improves quality. Diagrams, photographs, table, graphs. 9 ref.

**11504 Casting Stainless Steel and Other Alloys in Shell Moulds.** *Machinery (London)*, v. 84, Apr. 23, 1954, p. 853-861.

Equipment; patterns; dump box; and processes, including curing, stripping, and core making. Photographs.

**11505 Die Castings v. Sinterings.** H. K. Barton. *Machinery (London)*, v. 84, Apr. 30, 1954, p. 918-923.

Study of both processes. Graphs, diagrams, tables.

**11506 Foundry Magnesium-Base Alloys. XIV. Test Bars and Patterns. XV. Running Systems. XVI. Gating. XVII. Cooling in the Mold.** M. Caillon. *Metal Industry*, v. 84, Apr. 2, 1954, p. 271-272; Apr. 9, 1954, p. 285-288; Apr. 16, 1954, p. 308-309; Apr. 23, 1954, p. 328-331.

Comprehensive survey of molds; methods of pouring and chilling castings. Graphs, tables, diagrams.

**11507* New Core-Molding Process.** (German.) Fritz Brunn. *Metallurgie und Giesserei Technik*, v. 4, no. 3, Mar. 1954, p. 113-116.

Use of clay-free quartz sand and water glass hardened by injection of $CO_2$. Tables, photographs.

**11508* Metallurgical Principles in Development of Melting Units in Non-Ferrous Metal Foundry.** (German.) A. H. F. Goederitz. *Metallurgie und Giesserei Technik*, v. 4, no. 3, Mar. 1954, p. 130-136.

Suitability of various melting furnaces from economic viewpoint, design, and metallurgical considerations. Diagrams, photographs. 36 ref.

**11509* Alloyed Cast Iron Produced Without Imported Alloying Elements.** (Hungarian.) Nándor Hajtó. *Öntöde*, v. 5, no. 3, Mar. 1954, p. 49-58.

Alloying Fe with Mn, Al, and Si as substiutes for Ni. Structures, properties, and applications. Tables, charts, micrographs. 15 ref.

**11510* Silicones and Their Application in the Foundry. I-II.** (Hungarian.) Iván Lipovecz. *Öntöde*, v. 5, no. 3, Mar. 1954, p. 58-62; no. 4, Apr. 1954, p. 84-88.

Use and production of organic Si compounds as bonding agents for molds. Use in casting technology. Diagrams. 8 ref.

**11511* Data on the Surface Porosity of Steel Castings.** (Hungarian.) Károly Börzsönyi. *Öntöde*, v. 5, no. 4, Apr. 1954, p. 73-78.

Causes and control by more careful degassing of the melt. 6 ref.

**11512* Industrial Results in the Production of Modified Black Malleable Cast Iron.** (Hungarian.) János Lajtay. *Öntöde*, v. 5, no. 4, Apr. 1954, p. 79-84.

Type of furnace, structures, and application. Photographs, tables, graphs, micrographs.

**11513* Investigation of Some Hungarian Natural and Synthetic Sands for Magnesium Casting.** (Hungarian.) Gyula Emöd and Pál Németh. *Öntöde*, v. 5, no. 4, Apr. 1954, p. 88-94.

Properties of mixtures of synthetic and natural Hungarian sands. Graphs, tables, micrographs. 7 ref.

**11514* Talc as a Graphite Substitute for Mold Coating.** (Hungarian.) Imre Abaffy. *Öntöde*, v. 5, no. 4, Apr. 1954, p. 94-96.

Properties of best coating materials.

*Metals—Foundry Practice*

**11515* The 1954 Die Casting Program.** David S. Laine. *Precision Metal Molding*, v. 12, May 1954, p. 34-36, 84-86.
Compares use of Zn and Al in various industries. Tables.

**11516*** (Experience With Inserts Behind Risers in Steel Castings.) **Podnálitkové vlozky u ocelovych odlitku.** Vítezslav Batek. *Slévárenství*, v. 2, no. 1, Jan. 1954, p. 14-17.
Design, advantages, and application. Diagrams, photographs.

**11517*** (Chilled Cast Rolls.) **Litinové tvrzené válce pro válcovny.** Otto Necas. *Slévarenství*, v. 2, no. 2, Feb. 1954, p. 34-43; no. 3, Mar. 1954, p. 71-74.
Chemical composition, structure, thickness of chilled layer, and surface hardness. Production methods from molding to heat treatment. Tables, graphs, micrographs, diagrams. 26 ref.

**11518*** (Heavy Ilgner Wheel Castings.) **Odlévání velkych setrvacníku "Ilgner".** Václav Batek. *Slévárenství*, v. 2, no. 2, Feb. 1954, p. 46-48.
Method of casting heavy fly wheels. Shrinkage cavities and open-grain defects. Diagrams.

**11519*** (Experiences With the Production of a 105 Ton Steel Casting Press Stand.) **Zkusenosti s vyrobou 105tunového ocelového odlitku stojanu lisu.** J. Janousek. *Slévárenství*, v. 2, no. 3, Mar. 1954, p. 74-81.
Production methods. Diagrams, photographs, graphs.

**11520*** (Burning-On of Molding Materials on Castings.) **Príspevek ke studiu zapecenin.** Lev Petrzela. *Slévárenství*, v. 2; *Práce Ceskoslovenského Vyzkumu Slévárenskénho*, v. 1, no. 1, Feb. 1954, p. 1-12.
Method of testing; effect of C additions to sand and mold and core coatings; evaluation of results by comparison. Diagrams, micrographs, tables. 48 ref.

***See also:***
**10737** (rammed linings for cupolas)

## METALS—HEAT TREATMENT

**11521* Determining Depth of Hardness of Case-Hardened Steels.** (German.) Herbert Müller. *Archiv für das Eisenhüttenwesen*, v. 25, nos. 3-4, Mar.-Apr. 1954, p. 125-131; disc., p. 131-135.
Critical investigation of fracture structure, macro- and microscopic examination of polished specimens, scratch test, and hardness-depth curve. Tables, graphs, micrographs. 10 ref.

**11522* The Temperature Dependence of Decarburization of Steel by Hydrogen.** (German.) Kurt Lücke. *Archiv für das Eisenhüttenwesen*, v. 25, nos. 3-4, Mar.-Apr. 1954, p. 181-185.
Experimental and mathematical determination of $\alpha$- and $\gamma$-Fe. Time factor was established by tests on carbonyl Fe wire. Graphs.

**11523 Heat-Treatments of Welded Structures for Relief of Residual Stresses With Particular Reference to Type 347 Stainless-Steel Weldments.** W. L. Fleischmann. *ASME, Transactions*, v. 76, May 1954, p. 645-648.
Treatment at 1100 F produced untwisting and established a pattern of residual stresses that did not cause any further movement when wire was cycled from room temperature to 850 F. Graphs, tables, diagrams. 11 ref.

**11524* Inductive Heating With Low Frequencies.** (Dutch.) *Bedrijf en Techniek*, v. 9, no. 198; *Electronica Section*, v. 7, no. 145, Mar. 27, 1954, p. 49-51.
Operation of L. F. heating; effect on work piece; and advantages of process. Diagrams, photograph.

**11525* Presidential Address. Quenching.** George Parkin. *Birmingham Metallurgical Society, Journal*, v. 33, Dec. 1953, p. 143-154.
Mechanism, factors effecting cooling rates, media, and variations in practice.

**11526* Heat Treatments of Spheroidal Cast-Irons.** (French.) Marcel Ballay, Raymond Chavy, and Jacques Grilliat. *Fonderie*, 1954, Mar., no. 98, p. 3849-3862; disc., p. 3863.
Six different heat treatments. Resulting mechanical properties and structures. See item 8435, v. 3, June 1954. Tables, graphs, photograph, diagram. 12 ref.

**11527 Short-Cycle Normalizing Coordinates Tube Mill Production.** J. Kniveton. *Iron Age*, v. 173, May 6, 1954, p. 136-138.
Equipment, plant layout, operating procedures, advantages. Table, diagram, micrographs, graph, photograph.

**11528 Continuous Heat Treat Setup Carburizes Precision Parts.** C. A. Payntor. *Iron Age*, v. 173, May 20, 1954, p. 148-150.
Automatic, pusher-type, controlled-atmosphere gas furnaces simultaneously carburize aircraft gears to varying depths. Photographs.

**11529 Investigation of the Heat Treatment of Commercial Titanium-Base Alloys.** L. Luini and E. Lee. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 581-592.
Reports wide range of possible hardness and micro-structural characteristics. Brittleness and notch sensitivity appear to be characteristic of extensive age hardening. Gives ductility, tensile strengths, and elongations. Tables, graphs, micrographs. 5 ref.

**11530* Heat Treatment of Magnesium Alloys.** (Hungarian.) Gyula Emód. *Kohászati Lapok*, v. 9, no. 2, Feb. 1954, p. 76-85.
Stress relief, homogenization of structure, hardening, control of heat treatment, and equipment. Diagrams, graphs, tables, micrographs. 9 ref.

**11531* The Applicability of the Electrically Heated Salt Bath Tank Furnace Used for the Heat Treatment of Aluminum, and Methods for Avoiding the Danger of Explosions.** (Hungarian.) János Solymosi. *Kohászati Lapok*, v. 9, no. 2, Feb. 1954, p. 92-94.
Advantages of uniform temperature in all parts of the furnace. Possibility of treating pieces of varying compositions simultaneously. Diagrams.

**11532 Steam Tempering Furnace.** *Machinery Lloyd (Overseas Ed.)*, v. 26, Apr. 24, 1954, p. 121-122.
Advantages of steam; design considerations for installations. Diagram.

**11533 Notes on the Relative Merits of Pack and Gas Carburizing.** T. S. Lister. *Machinery (London)*, v. 84, Apr. 30, 1954, p. 902-904.
Importance of supervision, economics, and control.

**11534* Economizing in Alloying Elements for Steel by Suitable Heat-Treating.** (German.) H. Kubisch and H. Tauscher. *Metallurgie und Giesserei Technik*, v. 4, no. 3, Mar. 1954, p. 107-109. (Condensed from *Maschinenbautechnik*, v. 3, no. 1, 1954, p. 5-12; no. 2, 1954, p. 69-74.)
High-temperature bath and isothermal hardening with intermediate stage annealing; surface hardening; bath nitriding; high-temperature phosphating; hot-water treatment of tools; and surface diffusion of alloying elements.

**11535 Flame Hardening of Heavy Forgings.** Stephen Smith. *Metal Progress*, v. 65, May 1954, p. 100-103.
Advantages; misapplications, as use of improper steel, or lack of control, responsible for previous disappointments. Micrographs, graph, photographs.

**11536 Line of Salt Baths Heat Treats 90-Mm. Gun Recoil Mechanism.** Glenn F. Hyde. *Metal Progress*, v. 65, May 1954, p. 104-108.
Compares results to oil quenching. Photographs, diagram, tables.

**11537 Quench Cracks in Wrought Steel Tubes.** Cyril Wells. *Metal Progress*, v. 65, May 1954, p. 113-121.
Nature of cracking, statistics, susceptibility, causes, and remedies. Graphs, photographs, tables.

**11538 Annealed Gray Iron Castings.** Charles O. Burgess. *Product Engineering*, v. 25, May 1954, p. 142-145.

Annealing improves machinability and mechanical properties. Photograph, tables, graphs. 7 ref.

**11539 A Survey of Quenching Oils.** James McElgin. *Steel Processing*, v. 40, May 1954, p. 315-318.

Necessary characteristics of straight and compounded mineral oils and new high speed oils. Photographs, diagrams, graphs.

**11540*** (Heat Treating of Cast Magnesium Alloy ML-5 in Protective Atmospheres.) **Termoobrabotka litogo magnievogo splava ML-5 v zashchitnykh Gazakh.** I. A. Makolkin and S. N. Shestakov. *Zhurnal Prikladnoi Khimii*, v. 27, no. 4, Apr. 1954, p. 421-424.

Effect of $CO_2$ on mechanical properties. Tables. 8 ref.

*See also:*
**11621** (effect of nitriding on fatigue life of steel)

## METALS—MECHANICAL AND PHYSICAL PROPERTIES

**11541* Reflection and Radiation Power of Aluminum Foil and Sheets With Different Surfaces.** (German and French.) F. Rohner. *Aluminium Suisse*, v. 4, no. 2, Mar. 1954, p. 66-69.

Measurements for white light and ultra-violet rays. Radiation of pure Al and Peraluman-15 sheet 1.5 mm. thick with various surface treatments. Tables, diagrams.

**11542* Internal Stresses From Flame Surface Hardening.** (German.) Hans Bühler. *Archiv für das Eisenhüttenwesen*, v. 25, nos. 3-4, Mar.-Apr. 1954, p. 153-158.

Study of factors causing internal stresses and influence of stress relief temperature reveals relationship between flame hardening and water-quench method. Tables, graphs. 28 ref.

**11543 Heat Transfer to Lead-Bismuth and Mercury in Laminar and Transition Pipe Flow.** H. A. Johnson, J. P. Hartnett, and W. J. Clabaugh. *ASME, Transactions*, v. 76, May 1954, p. 513-517.

Experimental results in low Reynolds modulus range of 1000 to 10,000. Graphs. 25 ref.

**11544 Radiation in Metals.** N. W. Snyder. *ASME, Transactions*, v. 76, May 1954, p. 541-548.

A résumé of electromagnetic theory of radiation in metals. Graphs. 42 ref.

**11545 A Concept of Fatigue Damage.** S. M. Marco and W. L. Starkey. *ASME, Transactions*, v. 76, May 1954, p. 627-632.

Stepwise-varying stress sequences were applied to rotating-cantilever-beam specimens. Typical curves of fatigue damage versus cycle ratio were deduced. Graphs, micrographs, tables.

**11546 Thermal-Shocking Austenitic Stainless Steels With Molten Metals.** R. A. Tidball and M. M. Shrut. *ASME, Transactions*, v. 76, May 1954, p. 639-643.

Specimens of AISI 347 pipe and pipe welds were subjected to repeated thermal shocks by quenching innner surface with cool Na-K alloy. Eqiupment used and method of measuring transient fluid and wall temperatures. Diagrams, graphs.

**11547 Thermal Checking of Wrought-Steel Railway Wheel Material.** H. R. Wetenkamp. *ASME, Transactions*, v. 76, May 1954, p. 649-654.

Mechanism of formation of small cracks based on two heat cycles. Table, photographs, graphs. 5 ref.

**11548* The Magnetic and Electrical Properties of Cast Iron.** M. H. Hillman. *British Cast Iron Research Association. Journal of Research and Development*, v. 5, Apr. 1954, p. 188-248 + 48 plates.

Remanent magnetism, coercive force, hysteresis loss, maximum permeability, specific resistance, etc. of 24 combinations of graphite and matrix structure were determined. Tables, diagrams, graphs, micrographs. 26 ref.

**11549* Temper Embrittlement in Blackheart Malleable and Nodular Cast Irons.** G. N. J. Gilbert. *British Cast Iron Research Association. Journal of Research and Development*, v. 5, Apr. 1954, p. 249-263 + 4 plates.

Ferritic and blackheart irons with high Si and P contents, previously slowly cooled from 690 C become embrittled when heated for short time in range from 400 to 600 C and quenched. Mo decreases degree of embrittlement due to treatment at 450 C, both in irons quenched and slowly cooled from 650 C. Photographs, micrographs, graphs, tables. 11 ref.

**11550* Better Submarine Hull Is Goal of Model Basin Work.** R. E. Stark. *Bureau of Ships Journal*, v. 3, May 1954, p. 20-24.

Theoretical analyses of structural problem inherent in submarine design. Photographs, diagrams.

**11551* Gyromagnetic Relationships of Ferromagnetic Substances of the Fe-Co-Ni Group and Experimental Results of S. J. Barnett.** (French.) Sheldon Brown and André J.-P. Meyer. *Comptes rendus*, v. 238, no. 14, Apr. 5, 1954, p. 1480-1482.

Includes graphs. 11 ref.

**11552* Contamination of Samples in the Electronic Microanalyzer.** (French.) Raymond Castaing and Jacques Descamps. *Comptes rendus*, v. 238, no. 14, Apr. 5, 1954, p. 1506-1508.

Observations during intense and prolonged bombardment of metallic surface by X-ray beams. Reduction of deposit formation by removing organic vapors. Spectrograms. 3 ref.

**11553*** (Relation Between Fibrous Structure and Deformation Mechanism in Machined Chips as Determined by X-Rays.) **Relations entre les structures fibreuses des copeaux d'usinage déterminées par rayons X et le mécanisme de déformation dans la coupe des métaux.** Paul Bastien and Michel Weisz. *Comptes rendus*, v. 238, no. 15, Apr. 12, 1954, p. 1583-1585.

Formula offers solution of plastic flow problems on C-, S-, and Cr-Mo steels, and Al alloys. Diagrams. 9 ref.

**11554*** (Investigation of Field Emission of Nickel.) **Issledovanie avtoelektronnoi emissii nikelia.** G. V. Spivak and A. Gel'berg. *Doklady Akademii Nauk SSSR*, v. 94, no. 3, Jan. 21, 1954, p. 455-458.

Effect of H; Ni variation during passage through Curie point. Micrograph, graph. 11 ref.

**11555*** (Influence of Surface Geometry and External Medium on Cold Shortness of Steel.) **Vliianie geometrii poverkhnosti i vneshnei sredy na khladnolomkost' stali.** E. M. Shevandin, I. A. Razov, and R. E. Reshetnikova. *Doklady Akademii Nauk SSSR*, v. 94, no. 3, Jan. 21, 1954, p. 463-466.

Tests evaluate influence of surface geometry on strength and plasticity of steel under static tensile and bending stresses. Graph. 3 ref.

**11556* Dependence of Coercive Forces of Soft Magnetic Materials on Thickness of the Sheet.** (Russian.) V. A. Zaikova and Ia. S. Shur. *Doklady Akademii Nauk SSSR*, v. 94, no. 4, Feb. 1, 1954, p. 663-665.

Comparison of materials differing by the value and sign of their anisotropic and magnetostriction constants. Graphs, table. 3 ref.

**11557* Nature of Fracture During Plastic Deformation of Metals.** (Russian.) S. I. Gubkin and L. A. Rapoport. *Doklady Akademii Nauk SSSR*, v. 94, no. 4, Feb. 1, 1954, p. 685-688.

Formation of tensile stress, structural changes induced by recrystallization, and formation of new phases. Micrographs. 4 ref.

**11558* Magnetization Processes Conditioning the Phenomenon of Thermal Magnetic Hysteresis in Ferromagnetics.** (Russian.) N. A. Baranova and Ia. S. Shur. *Doklady Akademii Nauk SSSR*, v. 94, no. 5, Feb. 11, 1954, p. 825-827.

Study of long, thin Ni wires in temperature range from −195 to + 20 C in permanent magnetic fields up to 59 oersteds. Graphs. 4 ref.

## *Metals—Mechanical and Physical Properties*

**11559* The Magnetic Field of Steady Currents Found in Cavities or Channels Inside Iron With Infinitely High Permeability.** (Russian.) G. A. Grinberg. *Doklady Akademii Nauk SSSR*, v. 94, no. 5, Feb. 11, 1954, p. 839-842.

New and interesting theorems. Series of contradictions, inaccuracies, and errors present in literature. 2 ref.

**11560*** (Hardness of Gamma-Solid Solutions in the System Iron-Carbon at High Temperatures.) **Tverdost' Gamma-Tverdogo Rastvora Sistemy Zhelezo-uglerod Pri Vysokikh Temperaturakh.** K. A. Osipov and E. M. Miroshkina. *Doklady Akademii Nauk SSSR*, v. 94, no. 6, Feb. 21, 1954, p. 1065-1067.

Studies Armco Fe and Fe with 0.36 to 1.04% C, 0.13 to 0.20% Si, and 0.20 to 0.33% Mn at temperatures from 910 to 1100 C. Tables, graphs. 5 ref.

**11561* Theory of Anomalous Skin Effect in a Magnetic Field.** (Russian.) M. Ia. Azbel and M. I. Kaganov. *Doklady Akademii Nauk SSSR*, v. 95, no. 1, Mar. 1, 1954, p. 41-44.

Reflection of a plane monochromatic wave from the surface of a metal in a permanent magnetic field. 4 ref.

**11562* Theory of Measuring Magnetic and Dielectric Permeability of Semiconductors and Ferromagnets.** (Russian.) K. M. Polivanov. *Doklady Akademii Nauk SSSR*, v. 95, no. 1, Mar. 1954, p. 61-64.

Methods determines parameters using only 2-tests. Diagrams. 6 ref.

**11563* X-Ray Analysis of Structure of Chips Resulting From Metal Cutting.** (Russian.) S. I. Gubkin and L. T. Mendeleev. *Doklady Akademii Nauk SSSR*, v. 95, no. 1, Mar. 1, 1954, p. 73-74 + 1 plate.

Cu, Al, bronze, and steel chips show same structure as forged, rolled, or stamped parts. Radiograms. 2 ref.

**11564*** (Anisotropic Hall Effect in Tin.) **Anizotropiia effekta kholla u olova.** E. S. Borovik. *Doklady Akademii Nauk SSSR*, v. 95, no. 3, Mar. 21, 1954, p. 485-487.

Measurements at 4.22 K with consideration of potential differences, resistance changes, and magnetic field magnitudes. Graphs. 9 ref.

**11565*** (New Effect Caused by Gyromagnetic Phenomena.) **Novyi effekt, obyslovlennyi giromagnitnymi iavleniiami.** K. M. Polivanov. *Doklady Akademii Nauk SSSR*, v. 95, no. 3, Mar. 21, 1954, p. 501-503.

Field on surface of a magneto-dielectric plate placed near one side of wave guide during passage of wave. Diagram. 8 ref.

**11566*** (Creep of Tin Monocrystals.) **Polzuchest monokristallov olova.** E. P. Zakoshchikova. *Doklady Akademii Nauk SSSR*, v. 95, no. 3, Mar. 21, 1954, p. 575-577.

Plastic flow at stresses lower than creep limit. Influence of surface-active substances. Graphs. 5 ref.

**11567*** (Anisotropy of Magnetic Properties of Powdered Mn-Bi Alloy.) **Anizotropiia magnitnykh svoistv v poroshkovykh obraztsakh iz splava Mn Bi.** E. V. Shtol'ts and Ia. S. Shur. *Doklady Akademii Nauk SSSR*, v. 95, no. 4, Apr. 1, 1954, p. 781-784.

Magnitude of coercive intensity, residual magnetization, particle dimensions, and hystersis loop. Graphs, table. 4 ref.

**11568*** (Mechanism of Weakening and Rupture of Crystalline Bodies as a Function of Time at High Temperature.) **O mekhanizme razuprocheniia i razrusheniia kristallicheskikh tel so vremenem pri vysokoi temperature.** S. T. Kishkin. *Doklady Akademii Nauk SSSR*, v. 95, no. 4, Apr. 1, 1954, p. 789-791.

Decrease of strength, formation of cracks, strengthening, and weakening of Ni and Fe alloys. Graphs. 5 ref.

**11569*** (Damage to Metals Under Prolonged Loads at High Temperatures.) **O povrezhdaemosti metallov ot dliter'nogo nagruzheniia pri povyshennoi temperature.** Ia. B. Fridman and B. A. Drozdovskii. *Doklady Akademii Nauk SSSR*, v. 95, no. 4, Apr. 1, 1954, p. 793-796.

Damagability curve for Cr-Ni alloy at 600 C. Graph, micrographs. 10 ref.

**11570 Kinetics of the Reaction of Hydrogen With Zirconium.** Jack Belle, B. B. Cleland, and M. W. Mallett. *Electrochemical Society, Journal*, v. 101, May 1954, p. 211-214.

Rate of reaction of H and Zr determined from 250 to 425 C at 1 atm. pressure. Diagram, graphs, table, micrograph. 9 ref.

**11571*** (Formation of Cracks in Rails.) **Powstawanie rys na szynach kolejowych.** Józef Górecki. *Hutnik*, v. 21, no. 2, Feb. 1954, p. 35-40.

Causes of breaks, open and hairline cracks, and tangential stresses in the rail head. Diagrams, micrographs, photographs, graph, table. 1 ref.

**11572 The Domain Structure of Ferromagnetic Metals.** L. F. Bates. *Institute of Metals, Journal*, v. 82, May 1954, p. 417-425 + 6 plates.

Powder-pattern technique permits mapping of intersections of domain boundaries with suitably prepared surfaces. Graphs, diagrams, micrographs, photograph. 12 ref.

**11573 Resistivity Anomalies in the Nickel-Chromium System as Evidence of Ordering Reactions.** Rolf Nordheim and Nicholas J. Grant. *Institute of Metals, Journal*, v. 82, May 1954, p. 440-444.

During long-time annealing at temperatures below 500 C, the resistivity of alloys with more than 30 at.-% Cr decreases markedly. Effect is associated with long-range ordering, possibly of the CuAu type. Graphs. 9 ref.

**11574 Some Further Observations on the Fatigue Process in Pure Aluminum.** P. J. E. Forsyth. *Institute of Metals, Journal*, v. 82, May 1954, p. 449-455 + 3 plates.

Similarities and differences of deformation produced by cyclic and static stressing investigated microscopically and by multiple-beam interference technique. Micrographs, photograph. 6 ref.

**11575 A Theory of Hydrogen Embrittlement.** F. de Kazinczy. *Iron and Steel Institute, Journal*, v. 177, May 1954, p. 85-92.

Relation between H content; strength and ductility of steel. Graphs. 21 ref.

**11576 Tensile and Impact Properties of Fe-Si, Fe-Ni, Fe-Cr, and Fe-Mo Alloys of High Purity.** W. P. Rees, B. E. Hopkins, and H. R. Tipler. *Iron and Steel Institute, Journal*, v. 177, May 1954, p. 93-110 + 1 plate.

Tough-to-brittle transition at various temperatures. Micrographs, graphs, tables. 15 ref.

**11577 Effect of Heat-Treatment on the Brittleness of High-Purity Iron-Nitrogen Alloys.** B. E. Hopkins and H. R. Tipler. *Iron and Steel Institute, Journal*, v. 177, May 1954, p. 110-117 + 1 plate.

Tensile and notch-impact tests on 2 alloys in tough-to-brittle transition. Tables, graphs. 13 ref.

**11578 Practical Aspects of Hardness Testing of Steel Strip.** G. Molinder. *Iron and Steel Institute, Journal*, v. 177, May 1954, p. 159-164.

Applicability of some generally accepted methods on hardened cold-rolled strip. Diagram, graphs, tables. 4 ref.

**11579* Deformability of Pressure Worked Bronzes.** (Russian.) S. I. Gubkin and Iu. A. Tsvaigel. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk*, 1954, no. 1, Jan. 1, p. 128-137.

Investigation of Al-Fe, Be, and Sn-P bronzes from 20 to 900 C. Tables, graphs. 1 ref.

**11580 Isothermal Temper Embrittlement and the Effect of Hardness on Transition Temperature.** B. C. Woodfine. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 532-533.

Changes in transition temperature taking place on tempering a low alloy steel above 650 C, explained by normal processes

of tempering, are not result of abnormal embrittling change. Graph. 11 ref.

**11581 Mechanical Properties of Beryllium Fabricated by Powder Metallurgy.** W. W. Beaver and K. G. Wikle. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 559-573.

Survey of mechanical properties of commercially pure Be fabricated from powder by vacuum hot pressing and other consolidation methods. Effect of fabrication method, grain size, strain rate, and directionality upon both room and elevated temperature tensile properties. Tables, diagrams, photographs, graphs. 12 ref.

**11582 Mechanical Properties of Beryllium Copper at Subzero Temperatures.** J. T. Richards and R. M. Brick. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 574-580.

Experimental data on Be-Cu, Be-Co-Cu, and Be-Zn-Cu in wrought and cast conditions. Influence of cold work and age hardening treatment on subzero behavior. Effects of temperature on elastic and plastic deformation. Graphs, tables. 11 ref.

**11583 Electrical Resistivity of Dilute Binary Terminal Solid Solutions.** Walter R. Hibbard, Jr. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 594-602.

Published data used to establish theoretical relationships. Graphs, tables. 85 ref.

**11584 475°C (885°F) Embrittlement in Stainless Steels.** A. J. Lena and M. F. Hawkes. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 607-615.

Changes in hardness, tensile properties, microstructure, electrical resistance, and X-ray diffraction effects indicate lattice strains cause embrittlement of ferritic stainless steels when heated for relatively short times at 475 C. Graphs, tables, micrographs, radiograms. 24 ref.

**11585 Mechanism of Ortho Kink-Band Formation in Compressed Zinc Monocrystals.** J. J. Gilman. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 621-629.

Dependence of ortho kink-band formation on crystal orientation, temperature, and conditions at ends of specimen. Photographs, diagrams, graphs, micrographs. 13 ref.

**11586 Creep Behavior of Magnesium-Cerium Alloys.** C. S. Roberts. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 634-640.

Photographic study of micro-structural changes from 300 to 600 F shows creep resistance results primarily from potent precipitation hardening locally at grain boundaries. Tables, graphs, micrographs. 17 ref.

**11587 The Influence of Carbon and Manganese on the Properties of Semikilled Hot Rolled Steel.** F. W. Boulger and R. H. Frazier. *Journal of Metals*, v. 6, *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 645-652.

Effects on grain size and tensile and notched bar properties. Tables, graphs, diagrams, micrographs. 13 ref.

**11588 Impact Transition Temperatures of Some Pearlite-Free Mild Steels as Affected by Heat Treatments in the Alpha Range.** Ake Josefsson. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 652-659.

Transition temperatures of 0.01 to 0.02% C-steels are strongly influenced by cooling rate in α-range; quenching from the lower critical point causes low transition temperature even after strain aging. Tables, graphs, micrographs. 13 ref.

**11589*** (Surface Magnetic Anisotropy and Orientation Superstructures.) **Anisotropie magnétique superficielle et superstructures d'orientation.** Louis Néel. *Journal de physique et le radium*, v. 15, no. 4, Apr. 1954, p. 225-239.

Spontaneous magnetization and mechanical deformations of permanent magnet alloys. Graph. 19 ref.

**11590 Large Elastic Deformations of Homogeneous Anisotropic Materials.** J. L. Ericksen and R. S. Rivlin. *Journal of Rational Mechanics and Analysis*, v. 3, May 1954, p. 281-301.

Problem for materials possessing transverse isotropy is mathematically solved. 11 ref.

**11591 Some Factors Affecting the Dimensional Stability of the Silver-Tin-(Copper-Zinc) Amalgams.** J. A. Mitchell, I. C. Schoonover, George Dickson, and H. C. Vacher. *Journal of Research, National Bureau of Standards*, v. 52, Apr. 1954, p. 185-193.

X-ray shows free Hg present after initial solidification. It disappeared during period of greatest dimensional change. Tables, graphs, diagrams, X-ray diffraction charts. 9 ref.

**11592 A Cryoscopic Study of the Solubility of Uranium in Liquid Sodium at 97.8°C.** Thomas B. Douglas. *Journal of Research, National Bureau of Standards*, v. 52, May 1954, p. 223-226.

Impurities lowered freezing points about 0.035 C. Na containing finely divided U has a freezing point higher by 0.005 C. Graph, table, diagram. 1 ref.

**11593 Compressibilities of Crystalline and Glassy Modifications of Selenium and Glucose.** Charles E. Weir. *Journal of Research, National Bureau of Standards*, v. 52, May 1954, p. 247-249.

Compressibilities of glassy form were larger than for crystalline. Graphs, table. 11 ref.

**11594*** (Tendency of Local Change in Solution Pressure of Metals Under Slight Stresses.) **Örtliche Veränderungsbestreben des Lösungsdruckes von Metallen bei geringen Belastungen.** Paul Koch. *Metalloberfläche*, Ausgabe A, v. 8, no. 5, May 1954, p. 74-79.

Experimental and mathematical studies indicate that slip is probable cause. Graphs, diagram, tables. 21 ref.

**11595*** (Effect of Ultrasound on Temper of Metals.) **Action des ultra-sons sur la trempe des métaux.** J. Palmé. *Métaux, Corrosion-Industries*, v. 29, no. 343, Mar. 1954, p. 100-104.

Steel and Duralumin specimens tested for hardness and aging. Tables, micrographs, graphs.

**11596*** (Contribution to the Study of the Modulus of Elasticity of Metal Alloys.) **Contribution à l'étude du module d'élasticité des alliages métalliques.** René Le Roux. *Métaux, Corrosion-Industries*, v. 29, no. 343, Mar. 1954, p. 111-132.

Thermoelastic study and isothermal decomposition of eutectoid of Al bronzes. Tables, graphs, micrographs, diagram. 26 ref.

**11597* Relation Between Vickers Microhardness and Macrohardness.** R. Schulze. *Microtecnic (English Ed.)*, v. 8, no. 1, 1954, p. 13-26.

(Translated from German.) Elastic recovery of indentation can be ignored in macro- but not in micro-hardness range. Formula for correlation. Graphs, micrographs, diagrams. 12 ref.

**11598 Determination of the Plastic Yield Condition as a Variational Problem.** T. Y. Thomas. *National Academy of Sciences of the United States of America, Proceedings*, v. 40, May 1954, p. 322-331.

Mathematical analysis of condition that plastic flow occurs in such a way as to minimize a certain energy integral taken over region of flow.

**11599 Relationship Between Creep and Relaxation of Stresses in Metals.** I. A. Oding, O. V. Sorokin, and N. D. Sazanova. *National Science Foundation Translation*, no. 152, Dec. 1953, 4 p. (From *Doklady Akademii Nauk SSSR*, v. 92, 1953, p. 565-568.)

Previously abstracted from original. See item 8475, v. 3, 1954.

**11600 On the Theory of Magnetic Susceptibility of Thin Layers of Metals at Low Temperatures.** I. M. Lifshits and A. M. Kosevich. *National Science Foundation Translation, no.* 156, Jan. 1954, 5 p. (From *Doklady Akademii Nauk SSSR*, v. 91, 1953, p. 795-798.)

Previously abstracted from original. See item 3798, v. 3, 1954.

## *Metals—Mechanical and Physical Properties*

**11601 A New Technique for Investigating Surface Flow in Metal-Working Processes.** J. M. Capus and M. G. Cockcroft. *Nature*, v. 173, May 1, 1954, p. 821.

Surface scratches provide valuable means of investigating topography of surface flow during deformation. Micrograph. 1 ref.

**11602*** (Plastification of Soft Steel Plate-Web Girders.) **Plastification des poutres à âme pleine, en acier doux fléchies.** A. Lazard. *Ossature metallique*, v. 19, no. 5, May 1954, p. 274-284.

Fatigue properties of iso- and hyper-static girders. Graphs, diagrams, table.

**11603 Lattice Imperfections and Plastic Deformation in Metals. I. Nature and Characteristics of Lattice Imperfections, Notably Dislocations.** H. G. van Bueren. *Philips Technical Review*, v. 15, Feb.-Mar. 1954, p. 246-257.

Geometrical aspects and behavior under shear stress. Micrographs, diagrams. 15 ref.

**11604 Photoconductivity in Gold-Germanium Alloys.** Roger Newman. *Physical Review*, v. 94, ser. 2, Apr. 15, 1954, p. 278-285.

Results observed at 77 and 22 K in *n*- and *p*- type Au-doped Ge. Interpretation of quenching data in terms of hole trap model. Graphs. 4 ref.

**11605 Behavior of Ferromagnetic Domains Under Stress.** G. Bonfiglioli, A. Ferro, G. Montalenti, and G. Rosa. *Physical Review*, v. 94, ser. 2, Apr. 15, 1954, p. 316-318.

Analogy between effects of uniform magnetic field and static mechanical stress on motion of Weiss domains. Remanent strain and electrical resistivity variation reduced to zero by demagnetizing specimen. Graphs, diagram, table. 7 ref.

**11606 Electrical Properties of Pure Tellurium and Tellurium-Selenium Alloys.** Allen Nussbaum. *Physical Review*, v. 94, ser. 2, Apr. 15, 1954, p. 337-342.

Resistivity and Hall coefficient of pure single-crystals and 6 single-crystal alloys, from 2.7 to 13.2% Se by wt., measured over range 90 to 550 K. Diagrams, table, graphs. 13 ref.

**11607 Resistivity Changes in Copper, Silver, and Gold Produced by Deuteron Irradiation Near 10°K.** H. G. Cooper, J. S. Koehler, and J. W. Marx. *Physical Review*, v. 94, ser. 2, Apr. 15, 1954, p. 496.

Wires 99.97 ± 0.02% pure were irradiated with 12-m.e.v. deuterons. Tables. 3 ref.

**11608 Latent Heat of Transition of Superconducting Lead.** R. L. Dolecek. *Physical Review*, v. 94, ser. 2, May 1, 1954, p. 540-543.

Utilizing magnetic heating, calorimetric measurements of Pb were obtained from 2.5 to 7.0 K. Graphs, table, diagrams. 8 ref.

**11609 Resistance Anomalies in Some Rare-Earth Metals.** R. J. Elliott. *Physical Review*, v. 94, ser. 2, May 1, 1954, p. 564-568.

Anomalies observed in lighter metals explained by simple model of interaction between conduction electrons and *f* electrons tightly bound to each atom. Graphs. 13 ref.

**11610 The Magneto-Resistance Effect in Metals at High Frequencies.** B. Donovan. *Physical Society, Proceedings*, v. 67, no. 412A, Apr. 1, 1954, p. 305-314.

Effect of magnetic field on surface impedance of a metal with 2 overlapping bands of normal form. Graphs. 15 ref.

**11611 The Electrical Properties of Indium Antimonide at Low Temperatures.** J. Hatton and B. V. Rollin. *Physical Society, Proceedings*, v. 67, no. 412A, Apr. 1, 1954, p. 385-386.

Resistivity, Hall coefficient, and magneto resistance coefficients of semiconducting compound from 300 to 1 K. Graphs. 3 ref.

**11612 The Optical Constants of Tin Below the Superconducting Transition Temperature.** N. G. McCrum and C. A. Shiffman. *Physical Society, Proceedings*, v. 67, no. 412A, Apr. 1, 1954, p. 386-388.

Direct optical determination at 5890 A. 11 ref.

**11613* Internal or Residual Stresses in Wrought Aluminium Alloys and Their Structural Significance.** G. Forrest. *Royal Aeronautical Society, Journal*, v. 58, Apr. 1954, p. 261-276.

Dangers arising from inhomogeneity, directional properties, and residual stresses in design and production of structures. Graphs, tables, diagrams. 29 ref.

**11614 The Phase Transition in Superconductors. III. Phase Propagation Below the Critical Field.** T. E. Faber. *Royal Society, Proceedings*, v. 223, ser. A, Apr. 22, 1954, p. 174-194.

If superconducting nucleus is created at one end of a long rod of supercooled Sn, it grows down to other end with a velocity of order 10 cm. per sec. Quantitative theory is developed. Graphs, tables. 17 ref.

**11615 The Formation of Cracks as a Result of Plastic Flow.** A. N. Stroh. *Royal Society, Proceedings*, v. 223, ser. A, May 6, 1954, p. 404-414.

Stresses around a piled-up group of dislocations are investigated with reference to initiation of a crack. A crack should form when group consists of about 1000 dislocations in a cold-worked metal. 14 ref.

**11616* How Processing Introduces Residual Stresses.** R. L. Mattson. *SAE Journal*, v. 62, May 1954, p. 58-59.

Abridged from "Effects of Residual Stress on Fatigue Life of Metals" presented at SAE Annual Meeting, Detroit, Jan. 1954. Summary for designers and production men. Table.

**11617 Experiences With the Double-Cone Indenter.** P. Grodzinski. *Sheet Metal Industries*, v. 31, no. 325, May 1954, p. 383-390.

Stresses need for new form of hardness indenter. Basic advantages not given by other equipment are presented and proven. Photographs, diagrams, graphs, micrographs.

**11618*** (Steel Properties for Cast Kalpan Turbine Blades.) **Materiálové otázky při výrobé lopat pro Kaplanovy turbiny z oceli pro odlitky.** Alexander Nemes. *Slévárenství*, v. 2, no. 1, Jan. 1954, p. 2-9.

Advantages, limitations, chemical analysis, and mechanical properties of various types of steel. Tables, graphs. 3 ref.

**11619*** (Cracks in Gear Wheel Castings.) **Praskání odlitku ozubených kol.** Josef Pribyl. *Slévárenství*, v. 2, no. 1, Jan. 1954, p. 17-22.

Disadvantages of rigid construction; influence of thermal conductivity of material. Diagrams. 4 ref.

**11620*** (Investigation on the Machinability of Steels as De-Dependent on Heat-Treatment.) **Untersuchugen über die Zerspanbarkeit von Stählen in Abhängigkeit von ihrer Wärmebehandlung.** (Mechanical Properties and Structure of Steels Tested.) **Mechanische Eigenschaften und Gefügeausbildung der untersuchten Stähle.** Hans- Joachim Wiester. (Effect of Heat-Treatment of Steels on the Main Cutting Power in Turning.) **Einfluss der Wärmebhandlung von Stählen auf die Hauptschnittkraft beim Drehen.** Otto Kienzle and Hans Victor. (Effect of Heat-Treatment of Steels on Machinability in Turning and Boring With High-Speed Steel Tools.) **Einfluss der Wärmebehandlung von Stählen auf die Bearbeitbarkeit bein Drehen und Bohren mit Schnellarbeitsstahl-Werkzeugen.** Walther Leyensetter and Erhard Kaluza. *Stahl und Eisen*, v. 74, no. 9, Apr. 22, 1954, p. 526-551.

Tensile strength and examination of structure after various heat-treatments. Tables, micrographs, graphs, diagrams, photographs. 53 ref.

**11621* Endurance Strength. Nitriding vs. Shot-Peening.** *Tooling and Production*, v. 20, May 1954, p. 52-54.

Fatigue-life relationship between nitriding and shot-peening, on an automotive-type crank-shaft. Tables, graph, photograph.

**11622* Lüder's Lines on Metal Surfaces—Their Formation and Prevention.** (German.) R. Ergang. *Umschau in Wissenchaft und Technik*, v. 54, no. 8, Apr. 1954, p. 243-244.

Lines are visible in drawn steel or may cause cracking in enamelled products. Annealing at 600 to 650 C or pre-drawing

beyond the 2 to 4% elongation will correct this phenomenon. Photographs, graphs. 5 ref.

**11623 Directionality of Mechanical Properties in Hot-Worked Steels.** A. R. Troiana and L. J. Klingler. *Welding Journal*, v. 33, May 1954, p. 209S-217S.

Reports extent to which directionality is influenced by processing variables. Graphs. 29 ref.

**11624* Theory of Strain Hardening Using Creep in Metals.** (German.) Gerhard Lucas and Kurt Lücke. *Zeitschrift für angewandte Physik*, v. 6, no. 2, Feb. 1954, p. 64-70.

"Exhaustion theory" shows exponential distribution of activation energy leads to Andrade's parabolic creep law. Considers effect of temperature and stress. Graphs. 23 ref.

**11625*** (The Heating of Tensile Bars Due to Plastic Deformation.) **Über die Erwärmung von Zerreisstäben infolge plastischer Verformung.** Paul Täubert. *Zeitschrift für angewandte Physik*, v. 6, no. 3, Mar. 1954, p. 108-112.

Thermal conduction and heat transfer to surrounding areas. Influence of temperature on strength properties of a metal. Graphs. 2 ref.

**11626*** (Ultraoptical Properties of Metals and Average Free Path Length of the Conduction Electrons.) **Ultraoptische Eigenschaften von Metallen und mittlere freie Weglänge der Leitungselektronen.** Joachim Euler. *Zeitschrift für Physik*, v. 137, no. 3, Apr. 14, 1954, p. 318-332.

Measurements on 52 layers of Au with infra-red light show relationship between conductivity and optical properties is inadequately explained. Graphs, micrographs, diagram. 23 ref.

***See also:***
**11159** (effects of structure on physical properties)
**11414** (properties of temperature–compensator alloys)
**11464** (impact and bend tests on basic Bessemer steels)
**11526** (properties of spheroidal cast iron)
**11529** (mechanical properties of Ti alloys)
**11538** (properties of annealed gray iron castings)
**11540** (effect of $Co_2$ on properties of Mg alloys)
**11647** (strength of Al alloy extrusions)
**11671** (segregation and mechanical properties)
**11716** (surface properties of W crystals)
**11717** (surface properties of Ta crystals)
**11722** (δ-phase in ferritic-Cr and Cr-Ni austenitic steels)
**11724** (mechanical properties of graphitic steel)
**11725** (creep of amorphous materials)

## METALS—MECHANICAL WORKING

**11627 Cope Talks on Draw Dies. XII. Tapered Shells Require Skillful Operation Layout.** Stanley R. Cope. *American Machinist*, v. 98, May 10, 1954, p. 168-171.

Rules and applications for drawing tapered shells. Layout of preliminary shells. Diagrams.

**11628 How to Bend Aluminum Tube and Bar.** J. M. Adle. *American Machinist*, v. 98, May 24, 1954, p. 137-144.

Compares methods for cold-bending; analyzes tooling and lubrication. Photograph, diagrams.

**11629 Machining Titanium With Coolants.** *American Machinist*, v. 98, May 24, 1954, p. 155, 157, 159.

Effects on tool life by various liquid and gaseous coolants. Graphs, table.

**11630* Recent Developments in the Theory and Design of Electric Spark Machine Tools.** E. M. Williams, J. B. Woodford, Jr., and Richard E. Smith. *Applications and Industry*, 1954, no. 12, p. 83-86; disc., p. 87-88.

Results of fundamental research; design trends in electric circuits of spark machine tools. Oscillograms, micrographs, graphs, tables. 8 ref.

**11631 On the Theory of Regenerative Chatter in Precision-Grinding Operations.** R. S. Hahn. *ASME, Transactions*, v. 76, May 1954, p. 593-597; disc., p. 597.

Analysis based on proportionality of instantaneous wheel depth of cut to instantaneous dynamic force existing between wheel and work. Diagrams, graphs. 8 ref.

**11632 An Experimental Study of Metal Extrusions at Various Strain Rates.** J. Frisch and E. G. Thomsen. *ASME, Transactions*, v. 76, May 1954, p. 599-606; disc., p. 606.

Particle velocities, magnitude, and direction for inverted extrusion process using a sharp-edged die, determined on a meridian plane by step-wise method. Wall and mean pressures were obtained. Photograph, graphs, diagrams, tables. 7 ref.

**11633* The Theory and Practice of Wire Drawing. II. Researches Concerning Wire-Drawing Dies.** J. G. Wistreich. *Australasian Engineer*, 1954, Mar. 8, p. 61-66.

Investigations concerning die pressure, temperature, lubrication, and wear. Methods of industrial control. Diagrams, tables. 66 ref.

**11634* 7,000-Ton Forging Press.** Hans Ulmann. *Engineering Journal*, v. 37, May 1954, p. 557-563.

Designed for production of large ingots and billets, as well as for forming heavy plate. Photographs, diagram.

**11635*** (Drop Forging Hammers.) **Młoty matrycowe.** Wieslaw Wróblewski. *Hutnik*, v. 21, no. 2, Feb. 1954, p. 41-48.

Advantages, limitations, and various types of hammers. Power and impact forces. Diagrams, table.

**11636 The Big Squeeze.** Earl Bush. *Instrumentation*, v. 7, no. 3, 1954, p. 4-6.

How Ugine-Sejournet extrusion process uses instrumentation to assure uniform billet temperatures. Photographs.

**11637 Alloy Steel, Titanium Successfully Hot Extruded. I-II.** K. A. Wilhelm and G. A. Moudry. *Iron Age*, v. 173, Apr. 29, 1954, p. 98-102; May 13, 1954, p. 126-129.

Studies on extrudability, extrusion temperature, heat treatment, lubricants, and die design. Photographs, graphs, micrographs.

**11638 Drop Hammer, Trapped Rubber Dies Form Aircraft Parts Faster.** T. M. Rohan. *Iron Age*, v. 173, May 6, 1954, p. 121-123.

Materials, equipment, techniques, and applications. Table, photographs.

**11639 Titanium Machinability for Management. I.** *Iron Age*, v. 173, May 6, 1954, p. 128-131.

Feeds, speeds, tool life, power requirements, and other important data. Graphs, table, diagrams.

**11640 Deep-Drawing Properties of Sheet Steel. Fundamental Principles and Test Methods.** Olov Svahn. *Iron and Steel Institute, Journal*, v. 177, May 1954, p. 129-142.

Survey of research project started in 1945; two standard tests are proposed. Diagrams, tables, photographs, graphs. 47 ref.

**11641 Calculation of Roll Pressure and Energy Consumption in Hot-Rolling.** Gunnar Wallquist. *Iron and Steel Institute, Journal*, v. 177, May 1954, p. 142-158.

Calculation may be based on mathematical analysis or on empirical values obtained experimentally. Table, diagrams, photographs, graphs. 43 ref.

**11642* Investigation of Wear of a Cutting Tool by Means of Radioactive Isotopes.** (Russian.) E. P. Nadeinskaia. *Izvestiia Akademii Nauk SSSR, Otdelenie Teknicheskikh Nauk*, 1954, no. 1, Jan. 1, p. 24-40.

Influence of machining time, cutting speed, depth of cut, feed rate, and cooling agent on the wear of hard-alloy tool. Photographs, graphs.

**11643* Modern Drop Forging of Crank Shafts.** (Hungarian.) Lajos Metes. *Kohászati Lapok*, v. 9, no. 2, Feb. 1954, p. 72-73.

Advantages and methods of preforming pieces to be forged. Savings in raw material and better formation of flow lines. Photographs.

**11644* Nomograms for Determination of Power Need of Rolling Trains.** (Hungarian.) Antal Buza. *Kohászati Lapok*, v. 9, no. 3, Mar. 1954, p. 115-122.

Reviews construction of linear nomograms of parallel scales. Applies method of reversing rolling trains. Diagrams.

## *Metals—Mechanical Working*

**11645* Steels for Drop Forging. II.** (Hungarian.) Ernó Weigl. *Kohászati Lapok*, v. 9, no. 4, Apr. 1954, p. 154-161.

Properties, composition, and application of plain C and Ni steels for hot drop forging. Tables, graphs.

**11646 Cold Heading.** Frank C. Boyd. *Machine Design*, v. 26, May 1954, p. 187-190.

Recent developments in this production technique open new opportunities for cost saving in design. Photographs, diagrams.

**11647*** (Fibrous Fracture and Piping in Extrusions.) **Uber Holzfaserbruch und Zweiwachs beim Strangpressen.** A. Rühenbeck. *Metall*, v. 8, no's. 9-10, May 1954, p. 363-365.

Comparative strength tests and metallographic investigations on Al-Cu-Mg and Al-Cu-Mg-Pb alloys to determine cause of defects. Tables, photograph, micrographs.

**11648 Effect of Shot-Peening Variables and Residual Stresses on Fatigue Life.** R. L. Mattson and W. S. Coleman, Jr. *Metal Progress*, v. 65, May 1954, p. 108-112.

Abridged from paper presented before Society of Automotive Engineers, Oct. 1953, Hershey, Pa. Results of tests on leaf spring specimens. Graphs, photograph.

**11649 Factors Influencing the Tapping of Titanium.** *Metal-Working*, v. 10, June 1954, p. 14-15.

Hole specifications, cutting fluids, and tap selection. Tables, photographs, diagram.

**11650* Impact Extruding Magnesium.** C. Ridgely Kemp. *Modern Metals*, v. 10, May 1954, p. 44, 46.

Advantages and limitations. Photographs.

**11651* Assembly Machines Contribute to: Reduced Production Costs. Improved Quality.** C. A. Nichols and W. A. Fletcher. *SAE Journal*, v. 62, May 1954, p. 34-37.

Abridged from "Designing and Building High-Speed Production Assembly Machines," presented at SAE National Production Meeting, Chicago, Mar. 1954. In-line machines for automatic machining of major components can cut costs and improve quality. Photographs, diagram.

**11652* Statistical Controls Lengthen Life of Cutting Tools.** W. H. Seacord and F. L. Helmel. *SAE Journal*, v. 62, May 1954, p. 55-57.

Abridged from "Statistical Control Methods as Applied to Cutting Tools" presented at SAE Annual Meeting, Detroit, Jan. 1954. Statistical control of gear hobs, milling cutters, broaches, form tools, and other cutting tools lower costs. Photograph, graph chart.

**11653* Forming Proves Able Grappler in Aircraft Arena.** R. E. Furgeson. *SAE Journal*, v. 62, May 1954, p. 78-83.

Abridged from secretary's report of Panel on Forming, SAE Aircraft Production Forum, Los Angeles, Sept. 1953. Rubber, stretch, and draw forming. Photographs, diagrams.

**11654* Jigs and Fixtures for Oxy-Acetylene Cutting.** (German.) Hans von Hofe. *Schweissen und Schneiden*, v. 6, no. 4, Apr. 1954, p. 145-154.

Cutting parts with plane and curved surfaces. Photographs, diagrams. 8 ref.

**11655 The Forming of Aluminum Sheet. V. Drop-Hammer Forming.** H. Hinxman. *Sheet Metal Industries*, v. 31, no. 325, May 1954, p. 367-371, 377.

Economy of cost and time achieved. Tools, dies, and technique. Photographs, diagram. (To be continued.)

**11656 The Rolling of Metals and Alloys. I. Historical Development of the Rolling Mill.** Eustace C. Larke. *Sheet Metal Industries*, v. 31, no. 325, May 1954, p. 411-425.

Advantages associated with the use of small-diameter working rolls. Tables, photographs, diagrams. 19 ref. (To be continued.)

**11657* Milling of Cast Iron Objects With Mineral Ceramic Tools.** (Russian.) D. K. Margulis. *Stanki i Instrument*, v. 25, no. 2, Feb. 1954, p. 7-15.

Influence of various factors on wear and strength of cutters. Diagrams, graphs, photograph.

**11658*** (Machining of High-Strength Cast Iron.) **Obrabotka vysokoprochnogo chuguna.** N. N. Zorev and A. Ia. Artamonov. *Stanki i Instrument*, v. 25, no. 3, Mar. 1954, p. 14-15.

Application of coolants; effect on machine tool. Table, graphs.

**11659 How to Machine Titanium.** *Steel*, v. 134, May 3, 1954, p. 96-98.

Chief problem is short tool life causing abrasiveness, galling, and high tool tip temperatures. Graphs.

**11660 How to Grind Titanium.** C. I. Bradford. *Steel*, v. 134, May 17, 1954, p. 118-119.

Selection of proper wheels, use of effective coolants, and correct wheel feeds. Photographs.

**11661 How to Hot Work Titanium.** C. I. Bradford. *Steel*, v. 134, May 24, 1954, p. 100-101.

Ability to work Ti with conventional steel mill equipment is largely responsible for rapid industrial growth. Photographs.

**11662 Trends in Modern Forging.** Robert G. Friedman. *Steel Processing*, v. 40, May 1954, p. 285-294, 331.

Improvements in hot and cold forging techniques. Photographs.

**11663* Machining Titanium.** G. T. Fraser. *Tool Engineer*, v. 32, June, 1954, p. 81-83.

Abstracted from paper 22T36, "What Is Known Today About Machining Titanium", presented at the 22nd ASTE Annual Meeting. Developments in all forms of machining. Table.

**11664 Shielded-Metal-Arc Cutting and Grooving.** Helmut Thielsch and Joseph Quaas. *Welding Journal*, v. 33, May 1954, p. 438-446.

Principles of method. Characteristics and development of special coatings; cutting and grooving of mild steel, stainless steel, cast iron, and Cu; effects of electrode diameter, current, cutting speed. Photographs, diagrams, graphs, tables. 1 ref.

**11665 Use of Gas-Shielded Arc Processes for Cutting Non-Ferrous Metals.** W. G. Hull. *Welding and Metal Fabrication*, v. 22, May 1954, p. 188-191.

Argon- and self-adjusting-arc processes used for cutting materials not amenable to O cutting. Photographs, tables. 2 ref.

**11666* More About Aluminium Lubrication.** George Nicol. *Wire Industry*, v. 21, May 1954, p. 503-508.

Drawing problems and varieties of lubricants.

**11667* Stainless Steel Wire Properties Are Affected by Draw Speed.** Samuel Storchheim. *Wire and Wire Products*, v. 29, May 1954, p. 522-523, 564-567.

Cold reduction and properties of wire. Graphs, tables.

***See also:***
**11027** (power supply for rolling mills)
**11620** (machinability of steels)
**11621** (effect of shot peening on fatigue life of steel)

## METALS—METALLOGRAPHY, TRANSFORMATIONS, AND STRUCTURES

**11668 Valence Bond Calculations.** L. A. Schmid. *American Journal of Physics*, v. 22, May 1954, p. 255-263.

Nature of binding in molecular and ionic crystals and in metals. Features of the Slater-Pauling theory are developed. Diagrams. 7 ref.

**11669* The Electrochemical Processes in Electrolytic Separation of Structural Components of Steel With A.C. Current.** (German.) Walter Koch, Ilse Ramsauer, and Mark v. Stackelberg. *Archiv für das Eisenhüttenwesen*, v. 25, nos. 3-4, Mar.-Apr. 1954, p. 93-106.

Deficiency of current yield in isolation with square wave a.c. current; effect of structure on this deficiency; and different

variables on voltage and current-density curves. Diagrams, graphs, micrographs. 26 ref.

**11670* Research on Transformation Tendency and Hardenability of Steels.** (German.) Erich Greulich. *Archiv für das Eisenhüttenwesen*, v. 25, nos. 3-4, Mar.-Apr. 1954, p. 137-149; disc., p. 149-152.

Minimum half-life of isothermal austenite transformation considered as a characteristic index. Time-temperature-transformation diagrams of six steels alloyed with Cr, Mo, Ni, Si, and V were determined. Graphs, tables, micrographs.

**11671* Segregation Phenomena in a Chromium-Nickel Steel With 4.5% Nickel.** (German.) Werner Jellinghaus. *Archiv für das Eisenhüttenwesen*, v. 25, nos. 3-4, Mar.-Apr. 1954, p. 165-167.

Magnetometric and metallographic study of steel heat-treated up to 93 hr. in $\alpha$-$\gamma$ transformation range to investigate segregation of Ni. Effect on mechanical properties. Table, graphs, micrographs.

**11672* New Method of Etch Pit Formation on Iron Surfaces.** (French.) Jean Bardolle and Jean Moreau. *Comptes rendus*, v. 238, no. 13, Mar. 29, 1954, p. 1416-1418.

Electrolytic tests conducted in aqueous solutions of $NH_4CNS$. Micrographs. 14 ref.

**11673* An Electrolytic Method of Producing Etch Patterns on Alpha Copper-Zinc Solid Solutions.** (French.) Pierre-A. Jacquet. *Comptes rendus*, v. 238, no. 14, Apr. 5, 1954, p. 1508-1510.

Solution of 2% sodium hyposulfate heated to 50 C reveals traces of plastic deformation and polygonization. Micrographs. 4 ref.

**11674*** (The Appearance of a Particular Type of Surface Microstructure in a Nickel-Chromium Alloy Subjected to Selective Oxidation Reaction.) **Sur l'apparition d'un type particulier de microstructure superficielle dans un alliage nickel-chrome soumis à une réaction d'oxydation sélective.** Jacques Benard and Jean Moreau. *Comptes rendus*, v. 238, no. 16, Apr. 21, 1954, p. 1659-1661.

Changes in surface under various atmospheres and temperatures. Micrographs. 4 ref.

**11675*** (Electronographic Investigation of Thin Films of Mg-Sb, Mg-Bi, and Mg-Sn Alloys.) **Elektronograficheskoe issledovanie tonkikh plenok splavov Mg-Sb, Mg-Bi, Mg-Sn.** G. A. Kurov and Z. G. Pinsker. *Doklady Adademii Nauk SSSR*, v. 94, no. 3, Jan. 21, 1954, p. 439-441 + 1 plate.

Electronograms obtained by reflection and "passage", using metal films sublimated on thin celluloid strips. Photograph. 3 ref.

**11676*** (New Method of Observing Ultra-Fine Elements of Relief of a Crystal Face.) **Novyi metod obnaruzheniia sverkhtonkikh elementov rel'efa kristallicheskoi grani.** G. G. Lemmlein and N. V. Gliki. *Doklady Akademii Nauk SSSR*, v. 94, no. 3, Jan. 21, 1954, p. 473-475 + 1 plate.

Electronographic investigation of structure of $NH_4Cl$ "dew" on the faces of SiC crystals shows spiral-layer structure is characteristic of these crystals. Photographs, diagrams. 4 ref.

**11677* Diffusion of Cobalt, Chromium, and Tungsten in Iron and Steel.** (Russian.) P. L. Gruzin. *Doklady Akademii Nauk SSSR*, v. 94, no. 4, Feb. 1, 1954, p. 681-684.

Temperature dependence of diffusion coefficient in $\alpha$ and $\gamma$ phases of commercial Fe and steel. Eutectoid composition in temperature range from 700 to 1250 C. Tables, graphs. 6 ref.

**11678* Superheating of Solid Body in Vacuum.** (Russian.) D. S. Kamenetskaia and I. B. Piletskaia. *Doklady Akademii Nauk SSSR*, v. 94, no. 4, Feb. 1, 1954, p. 689-691.

Constitution diagrams of Mg, Zn, Cd, Mn, and Al in pressure-temperature coordinates. Graph, table. 2 ref.

**11679* Influence of Elements Forming Slightly Soluble Carbides on the Dissociation of Austenite.** (Russian.) L. I. Kogan and R. I. Entin. *Doklady Akademii Nauk SSSR*, v. 94, no. 4, Feb. 1, 1954, p. 693-696.

Kinetics of dissolution of Ti, Cb, and V additions and their effect on stability of austenite during heat-treatment. Table, graphs. 4 ref.

**11680*** (Diffusion of Silver in Iron-Palladium Alloys and Internal Adsorption of Palladium in Iron.) **O Diffuzii serebra v splavy zheleza s palladiem i o vnutrennei adsorbstii palladiia v zheleze.** V. I. Arkharov and B. A. Iunikov. *Doklady Akademii Nauk SSSR*, v. 94, no. 6, Feb. 21, 1954, p. 1057-1060 + 1 plate.

Intercrystalline character of diffused Ag. Micrographs. 5 ref.

**11681*** (Formation of Graphite in Cast Irons Modified by Magnesium.) **Ob obrazovanii grafita v chugunakh modifitsirovannykh magniem.** K. P. Bunin and Iu. N. Taran. *Doklady Akademii Nauk SSSR*, v. 94, no. 6, Feb. 21, 1954, p. 1061-1063.

Influence of austenitic structure on shape of graphite particles. Micrographs. 5 ref.

**11682*** (Diagram of Solubility of the System Ni-Cr-NiAl.) **Diagramma plavkosti sistemy Ni-Cr-NiAl.** I. I. Kornilov and R. S. Mints. *Doklady Akademii Nauk SSSR*, v. 94, no. 6, Feb. 21, 1954, p. 1085-1088 + 1 plate.

Microstructure and thermal analysis studies. Diagram, micrographs. 6 ref.

**11683* Adsorption of Additions on the Boundaries of Blocks in Aluminum.** (Russian.) I. E. Bolotov and Iu. D. Kozmanov. *Doklady Akademii Nauk SSSR*, v. 95, no. 2, Mar. 11, 1954, p. 293-295.

Indicates adsorption of Fe and Si between mosaic blocks in critically deformed commercial grade Al. 2 ref.

**11684*** (Unique Texture of Growth Originating During Diffusion in Se-Cu and Te-Cu Systems.) **Svoeobraznaia tekstura rosta, boznikaiushchaia pri reaktsionnoi diffuzii v sistemakh Se-Cu i Te-Cu.** V. I. Arkharov and Sabir Mardeshev. *Doklady Akademii Nauk SSSR*, v. 95, no. 3, Mar. 21, 1954, p. 517-519 + 1 plate.

Sealed, evacuated ampoules containing Cu in upper part and fine Se or Te powder in lower part were heated to 600 C and held from 2 to 20 hr. for X-ray study of crystal growth. Photographs, micrographs. 3 ref.

**11685*** (Electron Diffraction Investigation of Thin Films of Silver.) **Elektronograficheskoe issledovanie tonkikh plenok serebra.** A. I. Bublik. *Doklady Akademii Nauk SSSR*, v. 95, no. 3, Mar. 21, 1954, p. 521-523 + 1 plate.

Observations of hexagonal lattice. Dependence of film structure on rate of evaporation and thickness of film. Tables, photographs. 6 ref.

**11686*** (The Form of Temper Carbon Inclusions in Magnesium Cast Iron.) **O forme vkliuchenii ugleroda otzhiga v magnievykh chugunakh.** K. P. Munin and A. V. Chernovol. *Doklady Akademii Nauk SSSR*, v. 95, no. 4, Apr. 1, 1954, p. 785-787.

White iron annealed at 850, 950, and 1050 C. Structure of metal matrix determines form of graphite inclusions. Micrographs. 6 ref.

**11687*** (Electronographic Investigation of Structure of Cubic Iron Nitride.) **Elektronograficheskoe issledovanie struktury kybicheskogo nitrida zheleza.** Z. G. Pinsker and S. V. Kaverin. *Doklady Akademii Nauk SSSR*, v. 95, no. 4, Apr. 1, 1954, p. 797-799 + 1 plate.

Instrument and method of investigation permits differentiation of lines. Table, radiograms. 2 ref.

**11688* Statistical Mechanics of Two-Component Interstitial Solid Solutions.** A. L. G. Rees. *Faraday Society, Transactions*, v. 50, Apr. 1954, p. 335.

Theory applicable to any non-stoichiometric system where one component is volatile or gaseous. Graphs. 8 ref.

**11689* Interpretation of the Solubility of Hydrogen in Zirconium.** S. L. H. Martin and A. L. G. Rees. *Faraday Society, Transactions*, v. 50, Apr. 1954, p. 343-352.

Pressure and temperature dependence. Effect of O on initial solubility. Graphs. 13 ref.

**11690* X-Ray Anti-Reflections in Crystals. II. Calculation of the Integrated Reflection and Integrated Anti-Reflection for an Internal Reflection.** G. N. Ramachandran.

## *Metals—Metallography, Transformations, and Structures*

*Indian Academy of Sciences, Proceedings*, v. 39, sec. A, Feb. 1954, p. 65-80.

Mathematical study of variations in reflected and transmitted intensities with other factors *viz.* absorption coefficient, structure factor, asymmetry, and thickness of crystal. 12 ref.

**11691* Studies on the Texture of Crystals. I. NaCl, KCl and MgO.** V. M. Padmanabhan. *Indian Institute of Science, Journal*, v. 39, sec. A, Apr. 1954, p. 104-110 + 1 plate.

X-rays of cubic crystals suggest new method of texture study. Graphs, photographs. 11 ref.

**11692 A Redetermination and Interpretation of the Titanium-Rich Region of the Titanium-Chromium System.** M. K. McQuillan. *Institute of Metals, Journal*, v. 82, May 1954, p. 433-439 + 1 plate.

Phase boundaries in composition range 0-14 at.-% Cr. Present and previous micrographic results differ due to too slow quench in earlier experiments. Diagram, micrographs. 13 ref.

**11693 X-Ray Determination of the Alpha-Phase Boundary of the Copper-Indium Alloys System.** R. O. Jones and E. A. Owen. *Institute of Metals, Journal*, v. 82, May 1954, p. 445-448.

Maximum solubility of In in Cu is 10.85 at.-% at 575 C. Boundary below 575 C shows an inflection, suggesting a transformation at about 470 C. Tables, graph. 8 ref.

**11694 The System Uranium-Mercury.** B. R. T. Frost. *Institute of Metals, Journal*, v. 82, May 1954, p. 456-462.

Alloy system examined over composition range from −40 to 1000 C, by X-ray, thermal, and low-temperature micrographical analysis. Diagrams, tables. 15 ref.

**11695 The Ternary Compound *E* in the System Aluminium-Chromium-Magnesium.** K. Little. *Institute of Metals, Journal*, v. 82, May 1954, p. 463-464.

Single crystals of approximate composition $CrMg_{1.8}Al_{12}$, were examined goniometrically and by X-rays. Micrographs. 5 ref.

**11696 Formation of Martensite in Austenitic Stainless Steels. Effects of Deformation, Temperature, and Composition.** Tryggve Angel. *Iron and Steel Institute, Journal*, v. 177, May 1954, p. 165-174 + plate.

Isothermal formation induced by plastic deformation studied in the range −188 to 100 C. Graphs, table, micrographs, diagram. 32 ref.

**11697 Melting and Freezing.** Bruce Chalmers. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 519-532.

Experimental and theoretical studies of phenomena emphasize structure of resulting metal. Tables, diagrams, graphs, micrographs. 15 ref.

**11698 A Rationalization of the Oxygen Solid Solubility in Some Transition Metals.** A. U. Seybolt and R. L. Fullman. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 548-549.

Results of experimental studies. Table, graph. 8 ref.

**11699 Primary and Secondary Recrystallization in Cold Rolled Bicrystals of Silicon Iron.** C. G. Dunn. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 549-550.

Traces origin of secondary recrystallization grains by annealing a cold rolled bi-crystal specimen. Micrograph. 6 ref.

**11700 Role of Strain Energy in Solid Solution Thermodynamics.** E. S. Machlin. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 592-593.

Mathematical analysis. Table. 5 ref.

**11701 Investigation of the Grain Coarsening Behavior of Some Aluminum Alloys.** Harold Bernstein. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 603-606.

Effects of melt composition, pour temperature, and mold temperature. Results favor carbide theory of nucleation to peritectic theory. Tables, graphs, photographs. 6 ref.

**11702 Determination of the Self-Diffusion Coefficients of Gold by Autoradiography.** Harry C. Gatos and Anthony D. Kurtz. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 616-619.

Materials, apparatus, techniques, and results of studies. Diagram, graphs. 5 ref.

**11703 Allotropic Transformations at High Temperature.** James O. McCaldin and Pol Duwez. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 619-620.

Equipment and techniques for experimental studies. Graph, diagram. 6 ref.

**11704 Solubility of Oxygen in Alpha Iron.** A. U. Seybolt. *Journal of Metals*, v. 6; *American Instiute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 641-644.

Solubility a function of temperature, varies from about 0.008% O at 700 C to about 0.03% at 900 C. Graphs, tables, micrographs. 16 ref.

**11705 A Simple Method of Obtaining Low-Temperature X-ray Diffraction Photographs.** S. C. Wallwork and T. T. Harding. *Journal of Scientific Instruments*, v. 31, May 1954, p. 163-164.

Crystal mounted as usual on an oscillation goniometer may be maintained at −30 to −60 C. No precautions against ice formation are necessary. Diagram. 16 ref.

**11706* The Determination of the Ms Temperature by Dilatometric Method.** (English.) Hideo Nishimura and Toshishige Mitani. *Memoirs of the Faculty of Engineering, Kyoto University*, v. 16, no. 1, Jan. 1954, p. 1-7.

A technique for accurate determination. Graphs, diagrams, micrographs. 2 ref.

**11707* The Practical Use of a Three-Dimensional Weichelt Diagram for Alloyed Cast Iron.** (English.) Ant. W. van den Bergh. *Metalen*, v. 9, no. 7, Apr. 15, 1954, p. 103-106.

Diagram shows influence of Si on graphitization of cast iron. Graphs. 11 ref.

**11708* (Examination of Metal Surfaces With the Electron Microscope and by Electronic Diffraction. Experimental Part.** (Italian.) K. Huber. *Metallurgia italiana*, v. 46, no. 2, Feb. 1954, p. 41-48.

Methods used on Zn surfaces. Diffraction patterns, micrographs.

**11709*** (Phase-Contrast Microscopy in Metallography and Mineralogy.) **La microscopia a contrasto di fase nella metallografia e nella mineralogia.** R. Mitsche. *Metallurgia italiana*, v. 46, no. 3, Mar. 1954, p. 79-84.

Techniques and etchants for various materials. Photographs, micrographs.

**11710 Use of Electrons in the Examination of Metals.** A. G. Quarrell. *Metal Treatment and Drop Forging*, v. 21, Apr. 1954, p. 153-160, 167.

Development of electron microscope and its use in metallurgy. Diagrams, radiograms. 14 ref.

**11711 Heat-Treatment of High-Speed Steel. V. Transformations on Tempering of High-Speed Steel.** S. G. Cope. *Metal Treatment and Drop Forging*, v. 21, May 1954, p. 225-233.

Characteristics resulting from tempering after normal, arrested, and sub-zero quenching. Graphs, table, micrographs. 18 ref.

**11712 Metallography With the Electron Microscope.** J. Nutting. *Metal Treatment and Drop Forging*, v. 21, May 1954, p. 243-250.

Capabilities, aims, and limitations of instruments. Micrographs, table, diagrams. 18 ref.

**11713 On the Structure of Crystals of Martensite in Hardened Steel.** M. P. Arbuzov, L. I. Lysak, and Ye. G. Nesterenko. *National Science Foundation Translation, no.* 153, Jan. 1954, 3 p. (From *Doklady Akademii Nauk SSSR*, v. 90, 1953, p. 375-377.)

Previously abstracted from original. See item 1135, v. 3, 1954.

**11714 On the Possible Development of the Theory of Dislocations.** V. I. Arkharov, G. N. Kolensikov, and A. N. Orlov. *National Science Foundation Translation, no.* 212, Feb. 1954, 4 p. (From *Doklady Akademii Nauk SSSR*, v. 92, no. 4, Oct. 1, 1953, p. 751-754.)

Previously abstracted from original. See item 8608, v. 3, 1954.

**11715 A Remarkable Etching of Copper.** J. J. de Jong. *Philips Technical Review*, v. 15, Feb.-Mar. 1954, p. 238-240.

Principles and process of preparing metal for microscopic examination. Photomicrograph. 3 ref.

**11716 Thermionic and Surface Properties of Tungsten Crystals.** George F. Smith. *Physical Review*, v. 94, ser. 2, Apr. 15, 1954, p. 295-308.

Plateau-like surface structure was found. "Shingle" structure was observed superimposed on plateaus. Photograph, micrographs, tables, graphs, diagrams. 40 ref.

**11717 Growth and Surface Properties of Tantalum Crystals.** M. H. Nichols. *Physical Review*, v. 94, ser. 2, Apr. 15, 1954, p. 309-313.

Method consists of moving temperature gradient for producing cm.-long crystals in commercial Ta wire. Photographs, diagrams, table, micrographs. 15 ref .

**11718 Effect of Hydrostatic Pressure on the Superconducting Transition of Tin and Thallium.** Milan D. Fiske. *Physical Review*, v. 94, ser. 2, Apr. 15, 1954, p. 495-496.

Measured differences in threshold fields of 2 single crystals. One crystal held fixed while pressure on the other was varied by compressed He. Table.

**11719 Experimental Study of the Variation of the Degree of Order With Temperature in a Copper-Palladium Alloy.** D. Madoc Jones and E. A. Owen. *Physical Society, Proceedings*, v. 67, no. 412B, Apr. 1, 1954, p. 297-303.

X-ray study of $Cu_3Pd$, with reference to variation of degree of order with temperature as revealed by degree of tetragonality at different temperatures. Graphs, table. 2 ref.

**11720 Intrferometric Observation of Mosaic Structure on the (111) Face of a Single Crystal of Germanium.** Ajit Ram Verma. *Physical Society, Proceedings*, v. 67, no. 412B, Apr. 1, 1954, p. 359-360 + 1 plate.

Surface study by microscopic and interferometric techniques, Micrographs. 5 ref.

**11721*** (Evolution of Structure and Properties During Tempering of Rolled Alloy RB57.) **Évolution au cours du revenu de la structure et des propriétés de l'alliage RR 57 laminé.** Ch. Renon-Changarnier and J. Calvert. *Recherche Aéronautique*, 1954, no. 38, Mar.-Apr., p. 23-42.

Stabilization of $Al_2Cu$ precipitates by Mn and Ti in Al-Cu sheets tempered at various temperatures. Tables, graph, micrographs. 13 ref.

**11722* Metallographic Identification of the Sigma Phase in One Ferritic Chromium Steel and Two Austenitic Chromium-Nickel Steels. I. Introduction. Experiences With Ferritic Chromium Steel.** (Spanish.) Francisco Joanxich Aymá. *Revista de ciencia aplicada*, v. 8, no. 36, Jan.-Feb. 1954, p. 18-34.

Formation of sigma-phase from 500 to 800 C and its effect on hardness. Graphs, micrographs, tables.

**11723 The Transformation of α-Iron to γ-Iron During Abrasion.** R. P. Agarwala and H. Wilman. *Royal Society, Proceedings*, v. 223, ser. A, Apr. 22, 1954, p. 167-174 + 1 plate.

Abrasion of surface of an iron crystal, by a single 10 in. stroke on 0000 emery with light hand pressure, led to disorientated α-iron surface layer with some randomly disposed γ-iron. Diagrams, radiograms. 14 ref.

**11724*** (Graphitic Steel.) **Grafitová ocel.** Václov Oliverius. *Slévárenství*, v. 2; *Práce Ceskoslovenského Vyzkumu Slévárenského*, v. 1, no. 2, Feb. 1954, p. 13-20.

Effect of composition and heat treatment on graphitization, mechanical properties, and resistance to wear. Tables, graphs, micrographs, photograph. 19 ref.

**11725*** (Sintering, Creep, Relaxation, Recrystallization, and Other Phenomena Connected With Self Diffusion in Crystalline Bodies.) **Spekanie, krip, otdykh, rekristallizatsiia i drugie iavleniia obuslovlennye samodiffuziei v kristallicheskikh telakh.** B. Ia. Pines. *Uspekhi Fizicheskikh Nauk*, v. 52, no. 4, Apr. 1954, p. 501-559.

Effect of plastic deformation on recrystallization. Creep of amorphous bodies. Diagrams, graphs, tables, micrographs. 36 ref.

**11726*** (The Behavior of Oxygen Towards Molten Silver-Lead Alloys.) **Über das Verhalten von Sauerstoff zu Silber-Blei-Legierungen im Schmelzfluss.** Ernst Justus Kohlmeyer and Helmut Hennig. *Zeitschrift für Erzberbau und Metallhüttenwesen*, v. 7, no. 4, Apr. 1954, p. 153-161.

Effects of O on structure of various alloys. Photographs, tables, graphs, micrographs. 16 ref.

**11727* New Method of Producing Test Specimens of Varying Composition and Possibilities for Its Application.** (Russian.) D. A. Petrov and A. A. Bukhanova. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 1, Jan. 1954, p. 161-173 + 2 plates.

Extraction of solid phase from Al-Cu alloy melts to study phase relations in complex mixtures. Diagrams, graphs, micrographs. 2 ref.

**11728* Dissolving and Adsorption of Hydrogen by the Dispersed Palladium-Silver Alloys.** (Russian.) Zh. L. Vert and I. P. Tverdovskii. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 2, Feb. 1954, p. 317-327.

Solubility of H at room temperature decreases uniformly with increasing Ag content and reaches 0 in alloys with 72 to 75% Ag. Tables, graphs. 21 ref.

*See also:*
**11526** (structure of spheroidal cast iron)
**11557** (recrystallization in deformed metals)
**11573** (ordinary in Ni-Cr alloys)
**11580** (tempering processes)
**11620** (structures and machinability of steels)

## METALS—POWDER

**11729 Production and Properties of High-Purity Nickel B7 Powder.** F. A. Forward. *Institute of Metals, Journal*, v. 82, 1954; *Institute of Metals, Bulletin*, v. 2, May 1954, p. 113-116.

New process produces powder from Canadian ore, consists of a combined $NH_3$-leaching and H-reduction operation. Table, graph, micrographs.

**11730 Method Described for Evaluation of Lubricants in Powder Metallurgy.** I. Sheinhartz, H. M. McCullough, and J. L. Zambrow. *Journal of Metals*, v. 6, May 1954, p. 515-518.

Experimental procedure leads to mathematical relationships used to predict results. Diagram, graphs, tables. 7 ref.

**11731 The Warm Pressing of Beryllium Powder.** Norman P. Pinto. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 629-633.

Operated below recrystallization temperature. Ideal density attained at 550 to 600 C using 25 tons per sq. in. Graphs, diagrams, tables, micrographs. 12 ref.

**11732*** (Hot Pressing Molded Parts of Copper Powder.) **Das Heisspressen von Formkörpen dus Kupferpulver.** R. Palme. *Metall*, v. 8, no's. 9-10, May 1954, p. 369-371.

Oxidation prevented by use of methane. Increased hardness properties. Diagram, graphs, table, micrograph. 8 ref.

**11733*** (Recent Developments in Field of Powder Metallurgy.) **Neuentwicklung auf dem Gebiete der Pulvermetal-**

### *Metals—Powder*

**lurgie.** F. Benesovsky. *Metall*, v. 8, no's. 9-10, May 1954, p. 378-385.

Literature review. Photographs. 145 ref.

**11734* A New, Prealloyed, Stainless Steel Powder.** A. Adler. *Precision Metals Molding*, v. 12, May 1954, p. 54-56, 80-81.

Properties similar to sheet and bar stock. Ferritic Cr stainless types and certain high Ni alloys produced by this method. Tables.

**11735*** (Investigation of Oxidation Processes of Iron Powder at High Temperatures.) **Issledovanie protsessov okisleniia poroshkovogo zheleza pri povyshennykh temperaturakh.** P. D. Dankov and N. K. Andruschenko. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 3, Mar. 1954, p. 519-524 + 2 plates.

Oxidation velocity at 200, 400, 600, 800, and 1000 C. 3 ref.

***See also:***
**11108** (deposition of powdered Cu)
**11109** (electrodeposition of Cu, Zn, and Cd)
**11413** (powder metallurgy of heavy metals)
**11505** (characteristics of sintering)
**11567** (magnetic properties of Mn-Bi powder)
**11581** (Be powder metallurgy)

## MINING ENGINEERING

**11736* Problems of Deep-Drilling.** (Hungarian.) Ferenc Kassai. *Bányászati Lapok*, v. 9, no. 3, Mar. 15, 1954, p. 124-129.

Basic research, procurement of suitable drilling equipment, determining correct dimensions of test holes, and economic organization of industry.

**11737* Dream Rig Meets Tough Specifications.** John Norman. *Drilling*, v. 15, May 1954, p. 80-81.

Rig has 11-ft. substructure; utilizes steel mud tanks. Photographs.

**11738* Expense of Exploration.** H. M. Callaway. *Economic Geology*, v. 49, May 1954, p. 328-330.

Attempts to express by formula, factors determining permissible cost of exploration. Hypothetical exploration problems demonstrate how formula applies to prospect analysis.

**11739*** (Cement for Deep Drilling.) **Tiefbohrzemente. II.** (The Behavior of Cements for Deep-Well Drilling.) **Das Verhalten von Tiefbohrzementen in Bohrloch.** W. Wittekindt. *Erdöl und Kohle*, v. 7, no. 4, Apr. 1954, p. 203-207.

Requirements of special properties including sedimentation, viscosity, and resistance to high temperatures and pressures. Tables.

**11740 Development of an Underground Heat Wave for Oil Recovery.** Bruce F. Grant and Stefan E. Szasz. *Journal of Petroleum Technology*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 201, May 1954, p. 23-32; disc. 32-33.

Research to increase ultimate recovery from oil producing reservoirs. Graphs, tables, diagrams. 16 ref.

**11741 A Blotter-Type Electrolytic Model Determination of Areal Sweeps in Oil Recovery by In-Situ Combustion.** H. J. Ramey, Jr. and G. W. Nabor. *Journal of Petroleum Technology*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 201, May 1954, p. 35-39.

Satisfactory precision was achieved in preparing flow diagrams. Diagrams, graph. 10 ref.

**11742 Geophysical Surveying.** N. B. Bourne. *Machinery Lloyd (Overseas Ed.)*, v. 26, Apr. 24, 1954, p. 85-88.

Gravitational, seismic, magnetic, and electric methods and uses of applied geophysics. Diagrams.

**11743 When Do Dual Completions Pay?** Marshall C. Turner. *Oil and Gas Journal*, v. 53, May 17, 1954, p. 111-115, 127.

Economical practices in developing gas fields. Diagrams, table.

**11744 Drilling Speeded in Deep Well Operations.** J. E. Atkinson. *Petroleum Engineer*, v. 26, May 1954, p. B27-B30.

Jet bits used in conjunction with varying solids muds and high nozzle velocities speed penetration rate. Photographs, tables, graphs.

**11745 Rock Failure in Percussion.** John V. Pennington. *Petroleum Engineer*, v. 26, May 1954, p. B76 + 7 pages.

Relation of energy, velocity, and momentum studied by observing single-impact and successive blows on rock. Photograph, graphs, diagram.

**11746* Geochemical Prospecting in B.C.** Harry V. Warren and Robert E. Delavault. *Western Miner and Oil Review*, v. 27, May 1954, p. 48-50, 52.

Includes photographs. 4 ref.

**11747* Drilling Slim Holes in Hard-Rock Country.** Henry B. Brack. *World Oil*, v. 138, May 1954, p. 164, 167-168, 171.

Equipment, techniques, and economic advantages. Photographs.

***See also:***
**11738** (exploration expense in mining industry)
**11940** (measurement of dust in coal mines)

## NONDESTRUCTIVE TESTING

**11748* Sonic Velocities and Elastic Constants of Heterogeneous Substances.** (German.) H. Mandel. *Acustica*, v. 4, no. 2, 1954, p. 333-340.

Velocity of propagation of longitudinal and transverse waves in solid bodies is measured by pulse method. Material constants are derived. Application to alloys. Diagrams, graphs, photograph. 8 ref.

**11749* Research on Test Specimens With Known Defects for Determining Operating Conditions of Ultrasonic Testing.** (German.) Erich Theis and Klaus Barteld. *Archiv für das Eisenhüttenwesen*, v. 25, nos. 3-4, Mar.-Apr. 1954, p. 159-164; disc., p. 164.

Effects of impulse time, receiver sensitivity, contact and rear-wall surface conditions, position of defects in relation to sound beam, and support of quartz on the ratio of defect echo to rear-wall echo indicate possibility of estimating size of defect. Diagrams, graphs.

**11750 Surface Waves at Ultrasonic Frequencies.** E. G. Cook and H. E. VanValkenburg. *ASTM Bulletin*, 1954, no. 198, p. 81-84.

Theory of mechanical wave propagation along surface of an extended solid medium adapting it to non-destructive materials testing. Graphs, diagram, tables, oscillogram. 12 ref.

**11751 Portable Thulium X-Ray Unit. I. The Portable Unit.** S. Untermyer. **II. Methods for Preparing Thulium Oxide or Metal.** F. H. Spedding, A. H. Daane, and J. E. Powell. **III. Clinical Radiography With $Tm^{170}$ Source.** Robert J. Hasterlik. *Nucleonics*, v. 12, May 1954, p. 35-37.

Includes diagrams, graph, radiographs. 9 ref.

***See also:***
**11850** (analysis of ultrasonic wave fronts)
**12025** ($\beta$-meter for newsprint weight control)

## NUCLEAR PHYSICS, NUCLEONICS, AND RADIATION

**11752 Oxidation of Aqueous Ferrous Sulfate Solutions by Charged Particle Radiations.** William R. McDonnell and Edwin J. Hart. *American Chemical Society, Journal*, v. 76, Apr. 20, 1954, p. 2121-2124.

Chemical yields from $H^3$ $\beta$— and $Po^{210}$ $\alpha$-radiations. Tables, graph. 26 ref.

**11753* Nuclear Engineering: The Newest Branch.** Leonard E. Johnston. *American Engineer*, 1954, May, p. 21-22.

Advances make need for special training at engineering colleges.

**11754 On the Theory of the Van de Graaff Electrostatic Generator.** A. W. Simon. *American Journal of Physics*, v. 22, May 1954, p. 318-326.

Detailed quantitative theory of a two-carrier, constant potential, electrostatic generator. Diagrams, graph. 7 ref.

**11755 Materials for Nuclear Reactors.** Stuart McLain. *Chemical Engineering Progress*, v. 50, May 1954, p. 240-244.

Material choices for typical reactors. Tables.

**11756 Power Reactor Design Fundamentals.** W. E. Abbott. *Chemical Engineering Progress*, v. 50, May 1954, p. 245-248.

Factors to be balanced before 6-mill electric power is achieved. Tables, graph, diagram. 4 ref.

**11757 The Homogeneous Reactor Experiment.** S. E. Beall and C. E. Winters. *Chemical Engineering Progress*, v. 50, May 1954, p. 256-262.

Nuclear pilot plant for electrical power with aqueous U as fuel. Photographs, graphs, diagrams.

**11758 Decontamination of the Canadian Reactor.** F. W. Gilbert. *Chemical Engineering Progress*, v. 50, May 1954, p. 267-271.

Restoration program after accident at Chalk River project released highly radioactive fission products into buildings and equipment. Photographs, diagrams.

**11759* Barytes Aggregate and Grout Intrusion Method Used in Shield for Materials Testing Reactor.** Lewis Narrow. *Civil Engineering*, v. 24, May 1954, p. 292-295.

Barytes permits construction of shield two-thirds as thick as one of conventional concrete. Photographs.

**11760* Emission of a Photon Accompanied by Capture of a Fast Proton by a Nucleus.** (Russian.) A. I. Akhiezer and I. Ia. Pomeranchuk. *Doklady Akademii Nauk SSSR*, v. 94, no. 5, Feb. 11, 1954, p. 821-823.

Analytic method determines cross section of emission accompanied by absorption. 2 ref.

**11761* Nuclear Cleavage by a Heavy Meson.** (Russian.) Iu. G. Degtiarev, A. P. Zhdanov, and P. I. Lukirskii. *Doklady Akademii Nauk SSSR*, v. 94, no. 5, Feb. 11, 1954, p. 843-844 + 1 plate.

Elastic collision at end of range of particle with mass between that of a proton and a $\pi$ meson. Diagrams.

**11762*** (Effective Depth of Secondary Electron Emission.) **Effektivnaia glubina vtorichnoi elektronnosi emissii.** N. D. Morgulis and N. G. Nakhodkin. *Doklady Akademii Nauk SSSR*, v. 94, no. 6, Feb. 21, 1954, p. 1029-1032.

Investigations on Ag, Cu, Cr, Sb, Bi, Ti, In, Te, and Ge; and on Cu, Pb, In, Sn-Cs, and Sb-Cs after pretreatment in a vacuum. Table, graphs, diagram. 20 ref.

**11763*** (Study of Energy Levels of Aluminum and Boron Nuclei by Magnetic Analysis.) **Izuchenie energeticheskikh urovnei iader aliuminiia i bora metodom magnitogo analiza.** L. M. Khromchenko. *Doklady Akademii Nauk SSSR*, v. 94, no. 6, Feb. 21, 1954, p. 1037-1040.

Values for $Al^{28}$ and $B^{11}$. Tables, graphs. 10 ref.

**11764*** (Reactions Caused by $\mu$-Mesons in Hydrogen.) **Reaktsii, vyzyvaemye $\mu$-mezonami v vodorode.** Ia. B. Zel'dovich. *Doklady Akademii Nauk SSSR*, v. 95, no. 3, Mar. 21, 1954, p. 493-496.

Behavior of meso-hydrogen and -deuterium. 5 ref.

**11765*** (Study of Photodisintegrations With the Aid of Photographic Emulsions.) **Étude des photodésintégrations a l'aide des émulsions photographiques. II.** (Photodisintegration of Carbon Into Three $\alpha$-Particles.) **Photodésintégration du carbone en trois particles alpha.** Raymond Chastel. *Journal de physique et le radium*, v. 15, no. 4, Apr. 1954, p. 240-250.

Includes diagrams, graphs, tables, micrographs. 31 ref.

**11766*** (Neutralization of Space Charge of Bundles of Positive Ions by Accumulation of Electrons; Study of the Neutralization Time.) **Sur la neutralisation de la charge d'espace des faisceaux d'ions positifs par accumulation d'electrons; étude du temps de neutralisation.** René Bernas, Louis Kaluszyner, and Jean Druax. *Journal de physique et le radium*, v. 15, no. 4, Apr. 1954, p. 273-280.

Experimental study. Diagrams, graphs, photographs. 14 ref.

**11767 Use of Callendar's "Radio-Balance" for the Measurement of the Energy Emission From Radioactive Sources.** W. B. Mann. *Journal of Research, National Bureau of Standards*, v. 52, Apr. 1954, p. 177-184.

For absorption equivalent to 0.126 cm. of Pb, a heat emission of 128.9 cal. per g. per hr. was found for Ra in equilibrium with its products down to Ra-D. Accuracy is ±0.7%. Photographs, diagrams, tables, graphs. 6 ref.

**11768 Boron-Loaded Photographic Plates as Detectors of Slow Neutrons.** A. R. Baker. *Journal of Scientific Instruments*, v. 31, May 1954, p. 187-189.

Effect of B thickness and concentration on slow neutron flux. Can be used for health monitoring. Tables, graph. 10 ref.

**11769 NBS Radioactivity Standards.** *National Bureau of Standards, Technical News Bulletin*, v. 38, May 1954, p. 72-77.

Program to intercompare radioactive standards, creating and improving international standards of Ra and artificially produced radioactive nuclides. Table, photographs. 4 ref.

**11770 On the Many-Body Problem in Quantum Mechanics.** A. F. Tsander. *National Science Foundation Translation, no.* 154, Dec. 1953, 4 p. (From *Doklady Akademii Nauk SSSR*, v. 90, 1953, p. 761-764.)

Mathematical investigation of atomic nuclei. 5 ref.

**11771 Gamma-Ray Spectrum of the Bulk Shielding Reactor.** Fred Maienschein and Temple Love. *Nucleonics*, v. 12, May 1954, p. 6-8.

Interpretation of shielding data requires a knowledge of reactor $\gamma$-ray spectra. Results from scintillation spectrometer. Tables, graphs, diagram. 11 ref.

**11772 Composition, Decontamination of Radioactive Gas Mixtures.** Harold M. Busey. *Nucleonics*, v. 12, May 1954, p. 9-13.

Volumetric microanalysis determines chemical composition of reactor off-gases with radioactive components. Photographs, diagram, tables, graphs. 6 ref.

**11773 Photographic Detection and Dosimetry of Beta Rays.** Robert A. Dudley. *Nucleonics*, v. 12, May 1954, p. 24-31.

Effects of angle of incidence, energy, spectrum, development, and film properties on dosimetric properties of 5 films. Tables, graphs. 10 ref.

**11774 Measurement of the Tritium Concentration in Natural Waters by a Diffusion Cloud Chamber.** E. L. Fireman and D. Schwarzer. *Physical Review*, v. 94, ser. 2, Apr. 15, 1954, p. 385-388.

Six-in. diameter diffusion chamber, with 100 psi. of H obtained by converting 14 cc. of water in a Mg furnace, used to measure concentration in surface and well water, rain, and atmospheric moisture samples. Diagrams, photograph, table. 4 ref.

**11775 The Origin of Cosmic Rays.** Philip Morrison, Stanislaw Olbert, and Bruno Rossi. *Physical Review*, v. 94, ser. 2, Apr. 15, 1954, p. 440-453.

Conditions met by theory to explain high energies of cosmic-ray particles by mechanism of gradual acceleration in motion through space. Graphs, tables. 21 ref.

**11776 Energy Levels of Light Nuclei (Z = 11 to Z = 20).** P. M. Endt and J. C. Kluyver. *Reviews of Modern Physics*, v. 26, Jan. 1954, p. 95-166.

Nuclear energy levels for Na, Mg, Al, Si, and P. Tables, diagrams. 840 ref.

**11777 A Device for Determining Relative Stopping Powers for Natural Alpha Particles.** R. Hobart Ellis, Jr. *Review of Scientific Instruments*, v. 25, Apr. 1954, p. 336-340.

Stopping power for Po-$\alpha$ particles of thin solid or liquid films

*Nuclean Physics, Nucleonics, and Radiation*

can be compared with that of gases. Optical system measures film thickness. Diagrams, graph, photograph, table. 8 ref.

**11778 The Occurrence of an Unusually High-Level Radioactive Rainout in the Area of Troy, N. Y.** Herbert M. Clark, *Science*, v. 119, May 7, 1954, p. 619-622.

Readings taken during and after violent electrical storm, 36 hours after nuclear detonation in Nev. Tables, graphs, radiographs. 7 ref.

**11779 Metallurgical Problems in Nuclear Power Reactors. I. General Considerations.** Henry H. Hausner and John R. Bedell. *Sylvania Technologist*, v. 7, Apr. 1954, p. 35-41.

Operation and factors influencing selection of materials for fuels, cladding, coolants, and coolant systems. Tables, diagrams, photograph. 6 ref. (To be continued.)

***See also:***
**10642** (isotopes in agricultural research)
**10676** (biological effectiveness of X-rays)
**10759** (maintenance of radioactive processing equipment)
**10761** (production of $D_2O$)
**10808** (determination of tritium)
**10938** (exchange of labelled ions)
**11258** (photographic activity of ionization particles)
**11279** (design for atomic locomotive)
**11372** (plumbing for nuclear reactors)
**11426** (metallurgy of Pu)
**11607** (effect of radiation on resistivity of Cu, Ag, and Au)
**11917** (effects of radiation on plastics and rubber)
**11935** (disposal of radio active wastes)
**11941** (decontamination of radio active water)
**11974** (ventilation of atomic energy plants)

## OPERATIONS RESEARCH AND MANAGEMENT ENGINEERING

**11780* Pneumatic Conveying.** (English.) G. A. Pattantyús. *Acta Technica Academiae Scientiarum Hungaricae*, v. 8, nos. 1-2, 1954, p. 129-177.

Results of experiments on transportation of materials. Diagrams, graphs. 8 ref.

**11781* Ozone Toxicity. A Review of the Literature Through 1953.** Herbert E. Stokinger. *Archives of Industrial Hygiene and Occupational Medicine*, v. 9, May 1954, p. 366-383.

Re-evaluates research on $O_3$ to determine where further investigation should proceed. Tables. 61 ref.

**11782* Occupational Arsenic Poisoning.** May R. Mayers. *Archives of Industrial Hygiene and Occupational Medicine*, v. 9, May 1954, p. 384-388.

Effect, over 20-year period, of Cu acetoarsenite (Paris green) on one worker.

**11783* Some Observations on an Overseas Tour of Production Engineering Research Centres.** C. A. Gladman. *Australasian Engineer*, 1954, Mar., p. 47-55.

Organization and work of typical research organizations in Europe, Britain, and U.S.A. Influence of metallurgy on machinability, vibration dampers for boring quills, rotary cutting tool, spark machining, and electrolytically assisted grinding. Graphs, diagrams.

**11784* Fixed-Sample-Size Analysis of Sequential Observations.** F. J. Anscombe. *Biometrics*, v. 10, Mar. 1954, p. 89-100.

Considers situations to see if serious error will result from fixed-sample-size analysis. Graphs. 5 ref.

**11785* The Combination of Estimates From Different Experiments.** William G. Cochran. *Biometrics*, v. 10, Mar. 1954, p. 101-129.

Problem of combining experimental results taken by different persons using different procedures. Tables, 13 ref.

**11786*** (Bunkering.) **Bekohlung.** Fr.- F. Weise. *Brennstoff-Wärme-Kraft*, v. 6, no. 4, Apr. 1954, p. 121.

Electrical heating of dust bunker walls. Device eliminates Fe in coal. Instrument shows bunker content level. Diagrams, 2 ref.

**11787 Managing the Automatic Plant.** Charles E. Knight. *Chemical Engineering*, v. 61, June 1954, p. 225-229.

Effect of computers which completely control and monitor a process from start to finish on functions and structure of management. Diagram, photographs.

**11788* A Practical Manual of Material Handling Procedure. I. Phases of Material Handling and Packaging. II. Classification of Materials for Handling. III. Types of Handling Movements. IV. Procuring in Pack Lots.** W. B. McClelland. *Flow*, v. 9, May 1954, p. 79-81; June 1954, p. 90 + 6 pages.

Includes diagrams, analysis sheets, chart.

**11789* How to Deal With Resistance to Change.** Paul R. Lawrence. *Harvard Business Review*, v. 32, May-June 1954, p. 49-57.

Why workers resist change. Ways to make little changes spell progress.

**11790* Mathematical Programming. Better Information for Better Decision Making.** Alexander Henderson and Robert Schlaifer. *Harvard Business Review*, v. 32, May-June 1954, p. 73-100.

Basic principles, examples of operation, cost and profit information. Tables, chart. 12 ref.

**11791* How Much Should a Company Spend on Research?** Howard S. Turner. *Harvard Business Review*, v. 32, May-June 1954, p. 101-112.

Research can protect the *status quo*, or be a powerful competitive lever for growth. Graphs, tables. 1 ref.

**11792* Aerial Ropeways.** William Gilmore. *Mechanical Handling*, v. 41, May 1954, p. 243-250.

Various kinds of ropeways; types of installation. Photographs, table, diagrams.

**11793 Hydraulic Transport of Coal.** A. Graham Thomson. *Mechanical Handling*, v. 41, May 1954, p. 258-259.

Coal handling through pipelines. Diagram. 2 ref.

**11794* Management and Engineering.** Lillian Moller Gilbreth. *Midwest Engineers*, v. 6, Apr. 1954, p. 3-5, 14.

Discusses development of scientific management.

**11795* Future Growth of Mineral Industries Research.** John A. Hipple. *Mineral Industries*, v. 23, no. 8, May 1954, p. 1-5.

Estimates future expansion in training facilities, need of trained personnel. Graphs.

**11796* Quality Control in the Small Shop.** C. W. Kennedy. *Modern Machine Shop*, v. 26, May 1954, p. 136-143.

Techniques applied to large plants can be effectively patterned and fitted. Drawings, charts.

**11797* Quality Control Through Statistical Methods. VIII. Ready Made Sampling Plans.** Norbert Lloyd Enrick. *Modern Textiles Magazine*, v. 35, May 1954, p. 42-43, 62-63.

Includes charts, diagrams.

**11798* The Influence of Servicing Times in Quelling Processes.** Donald P. Gaver. *Operations Research Society of America, Journal*, v. 2, May 1954, p. 139-149.

Relation between distribution of customer-servicing times and customer-waiting times is derived for case of single-channel queue with random arrivals and rule of "first come, first served" establishing order of service. Graphs. 7 ref.

**11799* An Approximate Measure of Value.** C. West Churchman and Russell L. Ackoff. *Operations Research Society of America, Journal*, v. 2, May 1954, p. 172-181; disc., p. 181-187.

Based on actual or verbal choices of decision-makers. Method

can be applied to any number of objectives or outcomes, and to any number of decision-makers. Reliability of results can be measured. Tables. 5 ref.

**11800* Organization and Information Handling in Task Groups.** Lee S. Christie. *Operations Research Society of America, Journal,* v. 2, May 1954, p. 188-196.

Technique of group-action quantization permitted a well defined measure of group efficiency and a definite group goal. Experimental results. Diagrams, graphs. 5 ref.

**11801 Statistics for Everyday Use. II.** C. T. Shewell. *Petroleum Processing,* v. 9, May 1954, p. 696-707.

Techniques for application to the plant, pilot plant, or laboratory. Table, graphs.

**11802 Government Support of Basic Research in University Physics Department 1952-53.** J. Howard McMillen. *Physics Today,* v. 7, May 1954, p. 7-9.

Data on sources and distribution of Federal funds for unclassified research.

**11803 The Independent Research Institution.** Vannevar Bush. *Physics Today,* v. 7, May 1954, p. 19-21.

The independent organization, in its practical approach, demands youthful vigor to maintain a position at the front of progress.

**11804* Five Steps to Ward Off Plant Fires.** W. K. Ousley. *SAE Journal,* v. 62, May 1954, p. 29-31.

Abridged from "What Makes a Plant Safe?" presented at SAE Annual Meeting, Detroit, Jan. 1954. Studies show all major industrial fires could have been avoided if 5 basic, simple rules had been followed. Diagram.

**11805*** (Trackless Conveying in Iron and Steel Works.) **Gleislose Fördermittel in Hüttenwerk.** Hans-Dieter Zeumer. *Stahl und Eisen,* v. 74, no. 9, Apr. 22, 1954, p. 561-570.

Handling of ores, rubbish, and scrap. Trucks, shovel loaders, refractory brick pliers, and tipping containers. Photographs. 13 ref.

**11806* Accumulation of Methane in Coal Bunkers at Beneficiation Plants.** (Russian.) P. M. Petrukhin and I. P. Polianskii. *Ugol,* 1954, no. 4, Apr. p. 9-10.

Methane-bearing coal accumulates dangerous concentrations after 6 to 8 hr. in bunkers. Control by ventilation. 1 ref.

***See also:***
**10677** ($O_3$ poisoning and X-irradiation)
**10757** (design of chemical experiments)
**11225** (materials handling at gasworks)
**11652** (statistical control methods for cutting tools)
**12016** (safety for welders)

## ORE AND MATERIALS BENEFICIATION

**11807* Quick Determination of Specific Gravity and Moisture Content of Washed Coal.** (Hungarian.) Károly Martiny. *Bányászati Lapok,* v. 9, no. 3, Mar. 15, 1954, p. 113-124.

Theoretical and experimental details. Diagrams, tables.

**11808 Some Aspects on Sintering Operations and Sinter Usage. I.** Douglas Joyce. *Blast Furnace and Steel Plant,* v. 42, May 1954, p. 515-520, 554.

Benefits of incorporation of sinter in blast furnace burden depend on properties of sinter and other constituents. Tables.

**11809* Flotation of Non-Metallics.** Clarence Thom and H. J. Gisler. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 504, Apr. 1954, p. 240-250; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 57, 1954, p. 146-156.

Application of flotation process to beneficiation of non-metallic ores. Diagrams.

**11810* The Influence of Temperature on Efficiency of Grinding.** L. E. Djingheuzian. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 504, Apr. 1954, p. 251-259; disc., p. 259-262; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 57, 1954, p. 157-168.

Studies on solitic limestone, Cu-Ni ore, Ag-Pb-Zn ore, and quartz. Tables, graphs. 7 ref.

**11811 Laundering Fine Coal.** L. Dupret. *Coal Age,* v. 59, May 1954, p. 92-96.

High efficiency of new unit with vertical discharge. Tables, graphs, diagrams, photographs.

**11812* Influence of Cations on Stability of Anions in Melted Slags.** (Russian.) O. A. Esin and B. M. Lepinskikh. *Doklady Akademii Nauk SSSR,* v. 95, no. 1, Mar. 1, 1954, p. 135-138.

Measures e.m.f. and temperature effects. Table, graph. 5 ref.

**11813*** (Some Reasons for Incomplete Leaching of Gibbsite Bauxites.) **Nekotorye prichiny nepolnoi vyshchelachivaemosti Gibbsitovykh boksitov.** S. I. Beneslavskii. *Doklady Akademii Nauk SSSR,* v. 95, no. 5, Apr. 11, 1954, p. 1077-1080 + 1 plate.

Presence of various amounts of monohydrates of Al in amorphous or corundum forms. Tables, graphs, micrographs, spectrogram. 9 ref.

**11814* The Output of Gyratory Crushers.** K. Gauldie. *Engineering,* v. 177, Apr. 30, 1954, p. 557-559.

Movement of material between crushing surfaces is considered; output mathematically calculated. Diagrams, graphs.

**11815*** (Computation of the Principles for the Graph of Washery Curves.) **Die Errechnung der Grundlagen für das Waschkurvenbild.** Kurt Lemke. *Glückauf,* v. 90, nos. 17-18, Apr. 24, 1954, p. 449-454.

Efficiency of processing crude coal. Tables, graphs. 12 ref.

**11816 Phosphatic Slime.** Paul M. Tyler and Wm. H. Waggaman. *Industrial and Engineering Chemistry,* v. 46, May 1954, p. 1049-1056.

Problems of disposal; proposed industrial uses. Photographs, tables, diagrams. 4 ref.

**11817 Preparation of Ores. IV.** J. M. McLeod. *Iron & Steel,* v. 27, May 1954, p. 185-191.

Methods of agglomerating fines; direct smelting processes such as pelletizing, briquetting, vacuum extrusion, and nodulizing.

**11818 Aspects on Pelletizing of Iron Ore Concentrates.** Magnus Tigerschiöld. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 13-24.

Factors in performance of pelletizing method. Development of shaft-furnace process. Micrograph, tables, diagrams, photograph. 28 ref.

**11819 The Pelletizing of Northampton Sand Ironstones by Vacuum Extrusion: The Experimental and Pilot Plants at the Corby Works of Stewarts and Lloyds Ltd.** A. Stirling. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 25-42.

Essentials of process and application to low grade ores. Diagrams, tables, photographs, graphs. 9 ref.

**11820 The Development of a Pelletizing Process for Fine Iron Ores.** J. M. Ridgion, E. Cohen, and C. Lang. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 43-63 + 4 plates.

Laboratory and pilot-scale work, vertical-shaft kilns, pellet structure, and economic aspects. Photographs, diagrams, graphs, micrographs, table. 10 ref.

**11821 Aspects of Swedish Iron-Ore Concentration.** P. G. Kihlstedt. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 63-75.

Survey of present conditions for beneficiation. Tables, graphs. 19 ref.

**11822* Influence of Oxygen on the Flotability of Galenite and Chalcopyrite.** (Russian.) S. V. Bessonov and I. N. Plaksin. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1954, no. 1, Jan. 1, p. 114-127.

Qualitative index of effects of O on collecting agent. Table, graphs, photographs. 9 ref.

## *Ore and Materials Beneficiation*

**11823* Beneficiation Studies on a Pyrite Sample A From Alpha Mine, Wynaad, Nilgiris.** G. V. Subramanya and P. I. A. Narayanan. *Journal of Scientific & Industrial Research*, v. 13, sec. B, Mar. 1954, p. 213-215.

Tabling and flotation studies determine use as source of S. Tables.

**11824* Qualitative Investigation of Bauxite.** (Hungarian.) Bala Lányi. *Kohászati Lapok*, v. 9, no. 4, Apr. 1954, p. 162-172.

Behavior and quality of bauxites not indicated by the bauxite modulus. Tables, charts.

**11825* Data on Improving the Technology of the Settling of Red Mud by Means of Flour.** (Hungarian.) Endre Bogárdi. *Kohászati Lapok*, v. 9, no. 4, Apr. 1954, p. 172-177.

Preparation, handling, and effects of rye flour solutions used in alumina plants. Photographs, tables, micrographs, graphs.

**11826* Alkaline Pressure Leaching Processes.** F. A. Forward. *Mining Congress Journal*, v. 40, May 1954, p. 49-52, 77.

Operation at high pressures and temperatures speeds reactions; permits difficult separations with economies in equipment and reagents. Photographs, diagrams.

**11827 Taconite Beneficiation Comes of Age at Reserve's Babbitt Plant.** Oscar Lee. *Mining Engineering*, v. 6, May 1954, p. 484-488.

Equipment and operation of concentrating and pelletizing plant. Photographs, tables.

**11828 Flotation and the Gibbs Adsorption Equation.** P. L. de Bruyn, J. Th. G. Overbeek, and R. Schuhmann, Jr. *Mining Engineering*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 199, May 1954, p. 519-523.

Shows need for research in surface chemistry and mineral-air interface. 20 ref.

**11829 Evaluation of Sinter Testing.** E. H. Kinelski, H. A. Morrissey, and R. E. Powers. *Mining Engineering*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 199, May 1954, p. 527-533.

Various sinters and an iron ore were used to evaluate testing methods adapted to appraise sinter properties. Strength and dusting were related to total porosity, slag ratio, and total slag. Tables, graphs, diagrams. 15 ref.

**11830* Developments in the Science of Mineral Dressing.** E. F. Pryor. *Times Science Review*, 1954, Summer, p. 17-18.

Past and present mechanical and chemical methods. Includes graphite, Cu, and others. Photographs.

**11831* Mechanized Coal Mining and Cleaning. Effect on Air Pollution.** William Bradbury. *Utilization*, v. 8, May 1954, p. 47-50.

Use of improved coals better than extensive filter use. Photographs.

**11832*** (New Installations of the Mechernich Mining Co. With Special Consideration to Beneficiation.) **Die Neuanlagen der Gewerkschaft Mechernicher Werke unter besonderer Berücksichtigung de Aufbereitung.** Edgar Puffe. *Zeitschrift für Erzbergbau und Metallhüttenwesen*, v. 7, no. 4, Apr. 1954, p. 141-152 + 2 plates.

Concentration of low-grade Pb ores. Diagrams, maps, photographs, tables. 33 ref.

**11833*** (Sulfurization of Manganese Dioxide by Ferrous Sulfate and Pyrite.) **Sul'fatizatsiia dvuokisi margantsa sernokislym zhelezom i piritom.** H. P. Diev, M. I. Kochnev, V. V. Paduchev, and G. Ia. Sioridze. *Zhurnal Prikladnoi Khimii*, v. 27, no. 4, Apr. 1954, p. 356-359.

Oxidation roasting from 500 to 600 C permits transformation of 90 to 98% of Mn into a sulfate. Diagram, graphs, tables. 3 ref.

***See also:***
**10785** (drying equipment)
**10939** (surface active materials for mineral beneficiation)

## PHYSICS

**11834 Determination of Absolute Sound Levels and Acoustic Absorption Coefficients by Thermocouple Probes Theory Experiment.** William J. Fry and Ruth Baumann Fry. *Acoustical Society of America, Journal*, v. 26, May 1954, p. 294-317.

Includes graphs, tables, diagrams. 13 ref.

**11835 Theory of Ferroelectrics.** A. F. Devonshire. *Advances in Physics*, v. 3, Apr. 1954, p. 85-130.

Thermodynamics of transition in crystals and atomic models. Diagrams, graphs, tables. 37 ref.

**11836 An Electronic Apparatus for Automatic Recording of the Logorithmic Decrement and Frequency of Oscillations in the Audio and Subaudio Frequency Range.** Carl Olof Olsson and Kazimierz Orlik-Rückemann. *Aeronautical Research Institute of Sweden, Report no.* 52, 1954, 26 p. (TL526 A82r)

Apparatus is based on idea of representing harmonic damped oscillation by a rotating vector on screen of a cathode-ray tube in such a way that rate of decrease of length of vector is a measure of damping. Photographs, diagrams, graph.

**11837 The Effective Mass of Electrons in Crystals.** C. Kittel. *American Journal of Physics*, v. 22, May 1954, p. 250-252.

Transfer of momentum between a conduction electron and a crystal lattice is examined. Diagram. 2 ref.

**11838 Photonuclear Reactions.** Arthur I. Berman. *American Journal of Physics*, v. 22, May 1954, p. 277-290.

Excitation and transformation of nuclei by impact of photons involving electromagnetic rather than nuclear foces. Experimental techniques with high-energy X-rays. Diagrams, graphs, table. 51 ref.

**11839 Experiments on the Laws of Light Absorption.** Otto Blüh and Howard Ko. *American Journal of Physics*, v. 22, May 1954, p. 306-310.

Arrangement for measuring absorption coefficients of solids and liquids. Suggestions for various experiments with commercial apparatus. Diagram, graphs.

**11840 Uniform Approximations to Function of a Complex Variable.** S. N. Mergelyan. *American Mathematical Society, Translation no.* 101, 1954, 99 p. (From *Uspekhi Matematicheskikh Nauk*, (N.S.), v. 7, no. 2(48), 1952, p. 31-122.

Mathematical analysis. 35 ref.

**11841*** (Comparison of Graphite Arc With Ultra-Violet Standard.) **Über den Vergleich zwischen Graphitbogen und UV-Standard.** Joachim Euler. *Annalen der Physik*, v. 14, nos. 3-5, Feb. 15, 1954, p. 145-173.

Measurements of intensity and density of radiation; true color, black, and displacement temperatures. Tables, graphs, diagrams. 23 ref.

**11842 Brief Survey of Recent Developments in Heat Transfer.** Warren M. Rohsenow. *Applied Mechanics Reviews*, v. 7, June 1954, p. 233-234.

Boiling, condensation, forced-convection, turbulent flow, and other factors are briefly considered. 17 ref.

**11843* Relationship Between Time and Frequency and Examples on Determination of Building-Up Transient in Linear Systems.** (German.) Victor Fetzer. *Archiv der elektrischen Übertragung*, v. 8, no. 4, Apr. 1954, p. 163-172.

Relationship given by LaPlace integral. Building-up transient found by Heavyside expansion theorem. Image-transfer constant from transmitting and receiving functions. Tables, graphs. 6 ref.

**11844 Heat Transfer in a Gas-Fired Furnace.** S. J. Genna, E. J. Nolan, and A. A. Furczyk. *ASME, Transactions*, v. 76, May 1954, p. 527-536.

Results indicate 80% transfer by radiation from furnace walls to charge being heated and remainder by gas convection and gas radiation. Graphs, diagrams. 5 ref.

**11845 The Absorption of X-Rays by Plane Quartz Crystals in Vicinity of the Bragg Angle.** (French.) Gilbert Barrère. *Comptes rendus*, v. 238, no. 14, Apr. 5, 1954, p. 1494-1496.

Experimental study to relate appearance of X-ray transmission lines and crystalline perfection. 3 ref.

**11846*** (Divergence of the Series of Disturbance in Quantum Electrodynamics.) **O raskhodimosti riada teorii vozmushchenii v kvantovoi elektrodinamike.** B. L. Ioffe. *Doklady Akademii Nauk SSSR*, v. 94, no. 3, Jan. 21, 1954, p. 437-438.

Polarization of a vacuum by means of a constant external electromagnetic field. 5 ref.

**11847*** (Investigation of the Mechanism of Formation of the Image in the Electron Microscope.) **K issledovaniiu mekhanizma formirovaniia izobrazheniia v elektronnom mikroskope.** I. G. Stoianova and A. I. Frimer. *Doklady Akademii Nauk SSSR*, v. 94, no. 3, Jan. 21, 1954, p. 459-462.

Dependence of relative number of electrons passing through the aperture diaphragm on thickness of objective at four accelerating voltages for light- and dark-field images. Graphs. 2 ref.

**11848* Theory of Superconductivity.** (Russian.) B. T. Geilikman. *Doklady Akademii Nauk SSSR*, v. 94, no. 4, Feb. 1, 1954, p. 659-662.

Theoretical analysis of charged quantum liquid in electromagnetic field. Conditions of application. 7 ref.

**11849* Investigation of the Paramagnetism of Certain Ferrites.** (Russian.) F. Gal'perin, G. Dmitrakova, and L. Molodtsova. *Doklady Akademii Nauk SSSR*, v. 94, no. 5, Feb. 11, 1954, p. 833-834.

Investigation using Mn, Co, Mg, Co-Mn, and Co-Zn ferrites; Ferroxdur; and Vectolite. Graphs. 5 ref.

**11850* Conditions for Obtaining Greatest Concentration of Ultrasound.** (Russian.) L. D. Rozenberg. *Doklady Akademii Nauk SSSR*, v. 94, no. 5, Feb. 11, 1954, p. 845-848.

Problem of finding distribution function of amplitudes over the surface of a wave front. Diagrams. 5 ref.

**11851* Relaxation Time of Cuprous Oxide Luminescence and Its Dependence on Temperature.** (Russian.) N. A. Tolstoi and N. N. Tkachuk. *Doklady Akademii Nauk SSSR*, v. 95, no. 1, Mar. 1, 1954, p. 65-68.

Application of "ultrataumeter" for measuring velocity of relaxation. Diagrams, table, graph. 5 ref.

**11852*** (One Boundary Transition in the Theory of Stability of Elastic Rectangular Plates.) **Ob odnom predel'nom perekhode v teorii ustoichivosti uprugikh priamougol'nykh plastin.** A. Iu. Ishlinskii. *Doklady Akademii Nauk SSSR*, v. 95, no. 3, Mar. 21, 1954, p. 477-479.

Example where Saint-Venant principle does not apply. Graphs, diagram. 2 ref.

**11853*** (Investigation of the g-Factor of Certain Ferromagnets.) **Issledovanie g-faktora nekotorykh ferromagnetikov.** F. Gal'perin, I. Kupriianov, and B. Panfilov. *Doklady Akademii Nauk SSSR*, v. 95, no. 4, Apr. 1, 1954, p. 749-751.

Spectroscopic resolution of wave lengths in 3-cm. band by two methods. Graphs. 2 ref.

**11854 The Storage of Energy in Some Activated Alkali Halide Phosphors.** H. O. Albrecht and C. E. Mandeville. *Franklin Institute, Journal*, v. 257, May 1954, p. 353-368.

Emission by NaCl-Tl, KCl-Tl, NaCl-Ag, and KCl-Ag excited by α-particles, ultra-violet light, and X-rays at 25 C. Graphs. 12 ref.

**11855*** (Investigations of Oxidic Ferromagnetic Materials.) **Untersuchungen oxydischer Ferromagnet-Werkstoffe.** H. H. Meyer. *Giesserei*, v. 41, no. 9, Apr. 29, 1954, p. 240.

Magnetic properties of ferrites.

**11856*** (The Behavior of Colloidal Seignette Electrica III. Barium Titanate $BaTiO_3$.) **Das Verhalten von kolloidalen Seignetteelektrika III. Bariumtitanat $BaTiO_3$.** **M. Anliker,** H. R. Brugger, and W. Känzig. *Helvetica Physica Acta*, v. 27, no. 2, 1954, p. 99-124.

Properties of small crystals studied by X-ray diffraction, electron diffraction, electron microscopy, and dielectric measurements. Graphs, table, diagrams. 22 ref.

**11857* Propagation of Sound in an Isothermal Atmosphere.** (Russian.) L. N. Sretenskii. *Izvestiia Akademii Nauk SSSR, Seriia Geofizicheskaia*, 1954, no. 2, p. 134-142.

Fourier-Bessel integral applied in construction of an acoustic field potential for which asymptotic expressions are suitable for great distanecs from sound source. Diagrams.

**11858*** (Electromagnetic Properties of Plasmas Subjected to a Magnetic Field.) **Propriétés électromagnétiques des plasmas soumis a un champ magnétique.** Michel Bayet. *Journal de physique et le radium*, v. 15, no. 4, Apr. 1954, p. 258-263.

Movement of electrons, propagation of electromagnetic waves, and longitudinal vibrations. 9 ref.

**11859 Asymptotic Solution of Linear Hyperbolic Partial Differential Equations.** Morris Kline. *Journal of Rational Mechanics and Analysis*, v. 3, May 1954, p. 315-342.

Solution for some problems involving linear second order equations in $n$ independent variables. 12 ref.

**11860 Infrared Spectrum of Hydrogen Sulfide in the 6,290-cm$^{-1}$ Region.** Harry C. Allen, Jr. and Earle K. Plyler. *Journal of Research, National Bureau of Standards*, v. 52, Apr. 1954, p. 205-210.

Absorption measured under high resolution of rotational fine structure. Table, radiograms. 11 ref.

**11861 Radiative Corrections in the Decay of μ-Mesons.** E. M. Lipmanov. *National Science Foundation Translation, no.* 139, Dec. 1953, 3 p. (From *Doklady Akademii Nauk SSSR*, v. 90, 1953, p. 999-1001.)

Studies decay into three particles, an electron and two neutrons. 7 ref.

**11862 Two-Mirror Concentrator of Ultrasonic Waves.** L. D. Rozenberg. *National Science Foundation Translation, no.* 146, Dec. 1953, 4 p. (From *Doklady Akademii Nauk SSSR*, v. 91, 1953, p. 1091-1094.)

System has advantages of mirror apparatus but is free from its defects. Graphs, diagram. 7 ref.

**11863 Influence of the Adsorption of Gases and Vapors on the Characteristic Photoelectric Effect of ZnO and on the Photoelectric Effect on ZnO Sensitized by Chlorophyll and Similar Pigments.** Ye. K. Putseiko. *National Science Foundation Translation, no.* 149, Dec. 1953, 4 p. (From *Doklady Akademii Nauk SSSR*, v. 91, 1953, p. 1071-1074.)

Includes graphs. 10 ref.

**11864 Photoluminescence of PbS in the Infrared.** L. N. Galkin and N. V. Korolev. *National Science Foundation Translation, no.* 151, Dec. 1953, 2 p. (From *Doklady Akademii Nauk SSSR*, v. 92, 1953, p. 529-530.)

Previously abstracted from original. See item 8772, v. 3, 1954.

**11865 Characteristic Functions of Real Resonators.** V. M. Vakhnin. *National Science Foundation Translation, no.* 166, Jan. 1954, 5 p. (From *Doklady Akademii Nauk, SSSR*, v. 91, 1953, p. 779-782.)

Higher accuracy is obtained in solution of practical problems in contrast to current method of surface effect. Diagrams. 4 ref.

**11866 The Application of (RCA 1P 28)—Photomultiplier Tubes to the Detection of Weak Light Intensities.** F. Boeschoten, J. M. W. Milatz, and C. Smit. *Physica*, v. 20, no. 3, Mar. 1954, p. 139-156.

Two methods are discussed. Tables, graphs, photomicrographs, diagram. 17 ref.

**11867 Range Measurement of Low-Voltage Electrons.** Marguerite Davis. *Physical Review*, v. 94, ser. 2, Apr. 15, 1954, p. 243-245.

Energies of 600 and 2000 volts measured by biologically active molecule such as an enzyme. Amount of inactivation in uni-

## *Physics*

form layers of enzyme being a function of range. Graphs, table. 7 ref.

**11868 High-Frequency Resistance of Thin Films.** R. Broudy and H. Levinstein. *Physical Review*, v. 94, ser. 2, Apr. 15, 1954, p. 285-289.

Decrease of resistance beyond self-capacitance is due to non-uniform regions and not intercrystallite barriers. Graphs. 8 ref.

**11869 The Collective Description of Many-Particle Systems (A Generalized Theory of Hartree Fields).** Toichiro Kinoshita and Yoichiro Nambu. *Physical Review*, v. 94, ser. 2, May 1, 1954, p. 598-617.

Mathematical method applied to electro-magnetic properties of electron gases including plasma oscillation, property of metals, and superconductivity. 13 ref.

**11870 Hall Mobility of Electrons and Holes in Silicon.** P. P. Debye and T. Kohane. *Physical Review*, v. 94, ser. 2, May 1, 1954, p. 724-725.

Includes graphs.

**11871*** (Stability of Controllable Systems Having Two Elements of Control.) **Ob ustoichivosti reguliruemykh sistem s dvumia organami upravleniia.** A. P. Duvakin and A. M. Letov. *Prikladnaia Matematika i Mekhanika*, v. 18, no. 2, Mar.-Apr. 1954, p. 163-166.

Advantages of simplicity and greater applicability. 4 ref.

**11872*** (Secondary Elastic-Plastic Wave.) **Vtorichnaia uprugo-plasticheskaia volna.** N. F. Lebedev. *Prikladnaia Matematika i Mekhanika*, v. 18, no. 2, Mar.-Apr. 1954, p. 167-180.

Propagation of plastic wave along a bar with varying elastic limits. Diagrams, graphs. 9 ref.

**11873 Color Centers in Alkali Halide Crystals. II.** Frederick Seitz. *Reviews of Modern Physics*, v. 26, Jan. 1954, p. 7-94.

Observations and theory concerning crystals which were colored by addition of stoichiometric excess of one of the constituents or by ionizing radiations. Graphs, tables, diagrams. 212 ref.

**11874* Relaxation Phenomena of the Irreversible Magnetising Process in Highly Permeable Ferrites.** (German.) Theodor Einsele. *Zeitschrift für angewandte Physik*, v. 6, no. 2, Feb. 1954, p. 70-80.

Square-wave impulses determine dynamic induction-field strength curves of laminated and highly permeable ferrite cores. Possible causes and relaxation times. Diagrams, graphs. 11 ref.

**11875*** (Comparative Measurements of Electron Excitation on Reflecting and Translucent Luminescent Screens.) **Vergleichende Messungen an Aufsicht- und Durchsichteuchtschirmen bei Elektroenanregung.** Benedict Deubner and Fritz Hieber. *Zeitschrift für angewandte Physik*, v. 6, no. 3, Mar. 1954, p. 112-115.

Light yield and resolving power of different screens produced by deposition process and with Cu-activated ZnS. Graphs. 3 ref.

**11876*** (Magnetic Dispersion Spectrum of a Ni-Zn Ferrite.) **Magnetisches Dispersionspektrum eines Ni-Zn-Ferrits.** Ilse Lucas. *Zeitschrift für angewandte Physik*, v. 6, no. 3, Mar. 1954, p. 127-130.

A review. Broad permeability drop explained by superposition of acute spin resonances. Graph, diagram. 10 ref.

**11877*** (A New Magnetometric Process of Presenting Magnetizing Curves.) **Ein neues magnetometrisches Verfahren zur Darstellung von Magnetisierungskurven.** Rudolf Kühne. *Zeitschrift für angewandte Physik*, v. 6, no. 3, Mar. 1954, p. 131-132.

Circuit, design, and application of magnetometer. Diagrams, photographs. 3 ref.

**11878*** Irreversible Changes of Electron Mobility in Thin CdO Films.) **Irreversible Änderungen der Elektronenbeweglichkeit in dünnen CdO-Schichten.** Franz Lappe. *Zeitschrift für Physik*, v. 137, no. 3, Apr. 1954, p. 380-382.

Effect of temperature and heating rate on specific electrical conductivity and electron concentrations and mobility. Graphs. 2 ref.

**11879*** (Light Absorption and Electrical Properties of Highly Disordered CdO Films.) **Lichtabsorption und elektrische Eigenschaften stark gestörter CdO-Schichten.** Helmut Dunstädter. *Zeitschrift für Physik*, v. 137, no. 3, Apr. 14, 1954, p. 383-385.

Effects of gas mixture, wave length, heat-treating temperature and electron concentration on extinctive constants of CdO prepared under different conditions. Graphs. 4 ref.

**11880*** (A Reversible Fatigue Phenomenon of Secondary Emission on Glow-Cathodes With Semiconducting Layer Components.) **Eine reversible Ermüdungserscheinung der Sekundär-Emission an Glimmkathoden mit halbleitenden Schichtenkomponenten.** W. Kluge and A. Schulz. *Zeitschrift für Physik*, v. 137, no. 3, Apr. 14, 1954, p. 393-400.

Spontaneous elimination of fatigue accelerated by irradiating the cathode with infra-red waves. Diagrams, graphs. 11 ref.

***See also:***
**10726** (magnetic susceptibility of carbon and graphite)
**11178** (wave speeds in solids)
**11604** (photo conductivity in Au-Ge alloys)
**11606** (electrical properties of Te and Te-Se alloys)
**12003** (design of metal-to-plastic joint)

## PLASTICS

**11881 Polyesters—Low Pressure Laminating Resins.** H. Williams. *Adhesives & Resins*, v. 2, Apr. 1954, p. 83-88.

Materials of unsaturated polyester, epoxy, phenolic, silicone, and furane resin types. Outlines properties and uses in production of glass fiber laminates.

**11882* Canopy Moulding.** Richard Wood. *Aircraft Production*, v. 16, May 1954, p. 184-191.

Methods produce single-skinned units; free-blowing and grease-molding techniques. Photographs, diagrams.

**11883*** (Reinforced Plastics.) **Gewapende plasties.** P. L. H. Verbunt. *Bedrijf en Techniek*, v. 9, no. 195, Feb. 13, 1954, p. 81, 86.

Application and special properties.

**11884* Phenol, Furan, and Silicone Resins.** (Dutch.) P. L. H. Verbunt. *Bedrijf en Techniek*, v. 9, no. 198, Mar. 27, 1954, p. 147-149, 162.

Structure, properties, processing, and various applications. Tables, graph.

**11885 Sprayed Plastics Coatings.** R. Dickinson. *British Plastics*, v. 27, May 1954, p. 171-175.

Based on paper read at Symposium, College of Technology, Birmingham, Apr. 2nd. Reviews applications of Polythene, nylon, and other coatings by flame-spraying process. Photographs, diagram, table.

**11886 Stabilizers for Vinyl Polymers. I. Soaps.** H. Verity Smith. *British Plastics*, v. 27, May 1954, p. 176-179.

Theoretical aspects and practical considerations selection of stabilizers. 27 ref.

**11887 Polytrifluorochloroethylene for Corrosive Service.** Jules A. Jupa. *Chemical Engineering*, v. 61, June 1954, p. 272 + 3 pages.

New thermoplastic has favorable characteristics permitting diversified uses in chemical processing. Photographs, tables.

**11888 Gamma-Activation of Syntheses.** John G. Lewis, Joseph J. Martin, and Leigh C. Anderson. *Chemical Engineering Progress*, v. 50, May 1954, p. 249-255.

Polymerization of ethylene. Tables, graphs, photograph. 21 ref.

**11889* PVC and Polythene for Corrosion-Resistant Plant and Equipment.** V. Evans. *Chemical & Process Engineering*, v. 35; *Corrosion Technology*, v. 1, May 1954, p. 73-76.

Limitations; applications to fabricated structures and equipment, linings, coatings, and cements. Photographs.

**11890* Investigation of the Physical Structure of Synthetic Polyamides by Method of Infra-Red Absorption Spectra.** (Russian.) D. N. Shigorin, N. V. Mikhailov, and S. P. Makar'eva. *Doklady Akademii Nauk SSSR*, v. 94, no. 4, Feb. 1, 1954, p. 717-720.

Synthetic polyamides show different molecular structure depending on conditions of formation. Table, graphs. 5 ref.

**11891*** (Investigation of Light Diffusion in Mixtures of High Polymers.) **Issledovanie Svetorasseianiia v Smesiakh Vysokopolimerov.** S. S. Voiutskii, A. D. Zaionchkovskii, V. A. Kargin, and R. A. Reznikova. *Doklady Akademii Nauk SSSR*, v. 94, no. 6, Feb. 21, 1954, p. 1093-1096.

Investigation on polyvinyl chloride with butadiene nitrile copolymer as plasticizer. Graphs.

**11892* Determining Crystallinity and Melting Point of Polyethylene by Infra-Red Absorption Spectra.** (Russian.) V. N. Nikitin and E. I. Pokrovskii. *Doklady Akademii Nauk SSSR*, v. 95, no. 1, Mar. 1, 1954, p. 109-110.

Method excludes errors in measurement of thickness and change of coefficient of absorption for specimens of varied molecular weight. Graph. 4 ref.

**11893*** (Influence of Low-Molecular Substances on Deformation of Nitrocellulose in a Broad Range of Temperature.) **Vliianie nizkomolekuliarnykh veshchestv na deformatsiiu nitrotselliulozy v shirokom intervale temperatur.** P. V. Kozlov and E. F. Russkova. *Doklady Akademii Nauk SSSR*, v. 95, no. 3, Mar. 21, 1954, p. 583-586.

Mechanical behavior of pure and plasticized nitrocellulose. Graphs. 4 ref.

**11894 Mechanism of Absorption of Non-Ionic Dyes by Polyethylene Terephthalate.** M. J. Schuler and W. R. Remington. *Faraday Society, Discussions*, no. 16, 1954, p. 201-209.

Isotherms measured for distribution of 3 pure non-ionic dyes and their binary mixtures in presence and absence of benzoic acid. Tables, graphs, diagram. 9 ref.

**11895 The Drawing of 'Terylene'.** I. Marshall and A. B. Thompson. *Journal of Applied Chemistry*, v. 4, Apr. 1954, p. 145-153.

Method of analysis of continuous-drawing processes in terms of basic load-extension-temperature properties of high polymers. Graphs, photographs. 11 ref.

**11896 The Free Energy of Formation of the Amide Bond in Polyamides.** A. B. Meggy. *Journal of Applied Chemistry*, v. 4, Apr. 1954, p. 154-159.

Fundamental reaction of process; condensation of carboxyl and amino group to an amide group, with loss of a molecule of water; and relationship between this and degree of polymerization attainable under various conditions. Tables. 9 ref.

**11897 Crystallization Phenomena in Fibre-Forming Polymers.** L. B. Morgan. *Journal of Applied Chemistry*, v. 4, Apr. 1954, p. 160-172.

Reviews fundamentals of crystallization processes. Effects of crystallization variations on polymer structure. Micrographs, drawings. 27 ref.

**11898 The Extrusion and Properties of 'Saran' Monofilaments.** J. Jack and R. A. Horsley. *Journal of Applied Chemistry*, v. 4, Apr. 1954, p. 178-188.

Changes in molecular structure during production of vinylidene chloride copolymer. Effect on properties. Graphs, diagrams, photograph. 11 ref.

**11899 Linear Polymerization and Synthetic Fibers.** Robert W. Moncrieff. *Journal of Chemical Education*, v. 31, May 1954, p. 233-237.

Historical development of polymeric chemistry.

**11900 Apparent Specific Volume of Polystyrene in Benzene, Toluene, Ethylbenzene, and 2-Butanone.** Maurice Griffel, Ralph S. Jessup, Joseph A. Cogliano, and Rita P. Park. *Journal of Research, National Bureau of Standards*, v. 52, Apr. 1954, p. 217-222.

Density measurements near 27 and 30 C. Changes in volume upon mixing effect such thermodynamic properties as heat, free energy, and entropy of mixing. Graph, tables, diagram. 18 ref.

**11901* Self-Adhesion of High Polymers. III. Influence of Molecular Weight, Form of Molecule, and Polar Groups Present in Molecule on Self-Adhesion of High Polymers.** S. S. Voiutskii and B. V. Shtarkh. *Kolloidnyi Zhurnal*, v. 16, no. 1, Jan.-Feb. 1954, p. 3-9.

Includes tables, graphs. 5 ref.

**11902*** (Resistance of Ethoxylin Resins to Chemical Attack. Behavior of Araldite Casting Resin B Towards Chemicals.) **Chemikalienbeständigkeit von Äthoxylinharzen.** Konrad Meyerhans. *Kunststoffe*, v. 44, no. 4, Apr. 1954, p. 135-142.

Heat resistant and easily processed resins suitable for self-supporting construction materials and surface protection. Tables, graphs, photographs.

**11903*** (Annual Report for 1953 on the Work of Plastics Standardization Committee in the DNA.) **Tätigkeitsvericht 1953 des Fachnormenausschusses Kunststoffe im DNA.** A. Höchtlen and G. Ehlers. *Kunststoffe*, v. 44, no. 4, Apr. 1954, p. 145-151.

Survey of published and tentative standards. Table. 35 ref.

**11904*** (Styropor—A Novel Porous Plastic Material.) **Styropor—ein neurartiger, poröser Kunststoffe. I-II.** Fritz Stastny. *Kunststoffe*, v. 44, no. 4, Apr. 1954, p. 173-180; no. 5, May 1954, p. 221-226.

Manufacturing, properties, and applications. Photographs, graphs. 18 ref.

**11905*** (Measures for the Improvement of PVC Sheeting and Leathercloth.) **Methoden zur Veredelung von Folien und Kunstleder aus PVC.** W. Tischbein. *Kunststoffe*, v. 44, no. 4, Apr. 1954, p. 181-182.

Cross-linked surface coatings from specially selected and commercially available Desmophen/Desmodur combinations. Techniques of applying polyurethane coatings. 4 ref.

**11906 Casting Plastics.** John R. Charlton. *Machine Design*, v. 26, May 1954, p. 127-133.

Uses of acrylics, epoxys, cellulosics, phenolics, and polyesters. Mass production of potted parts such as servo and fractional hp. motors. Photographs, tables, drawing.

**11907 Kel-F Plastic.** J. A. Jupa. *Machine Design*, v. 26, May 1954, p. 147-152.

Chemical inertness, toughness, and strength from below 0 to over 300 F, high electrical insulating properties, and dimensional stability are properties of trifluoro chloro ethylene polymer plastics. Photographs, tables, graph, drawing.

**11908 Foamed Vinyl Plastics.** R. A. Calsibet. *Machine Design*, v. 26, May 1954, p. 163-165.

Characterized by exceptional resistance to organic acids, alkalies, and oxidizing agents, not dissolved by greases, oils, aliphatic hydrocarbons, alcohols, or glycols. Photographs, table.

**11909 Silicones.** T. A. Kauppi. *Machine Design*, v. 26, May 1954, p. 184-186.

Pressure-sensitive adhesives, rigid cellular structures, and rubbers are among new uses. Photographs.

**11910* Polyethylene as a Food Film.** C. J. B. Thor and M. Goldman. *Modern Packaging*, v. 27, May 1954, p. 155-158, 230, 233.

Reviews development and properties of interest to food packers. Graphs, photographs, spectrogram, tables.

**11911 High-Strength Plastics.** Albert G. H. Dietz. *National Academy of Sciences of the United States of America, Proceedings*, v. 40, Mar. 1954, p. 157-161.

Materials where plastics act as binders. Strength, toughness,

## *Plastics*

rigidity, resilience, and flexibility are controlled by selecting and proportioning fibers and resins. Diagrams, graph. 3 ref.

**11912* High Polymer Chemistry in Protective Coatings.** E. G. Shur. *Paint and Varnish Production*, v. 44, May 1954, p. 30-31, 73.

Mechanism of polymerization; synthesis of polymers; and properties, including solubility, viscosity, and oxidation-condensation reactions. 4 ref.

**11913* Mylar Polyester Film and the Converter.** D. D. Lanning. *Paper, Film and Foil Converter*, v. 28, June 1954, p. 20-26.

Versatile in field of decorative laminates, new film offers combination of unusual properties. Graphs, tables, photographs.

**11914*** (Applications and Possibilities of Polyester Resins.) **Toepassingen en mogelijkheden van polyester harsen.** H. A. K. Eden. *Plastica*, v. 7, no. 4, Apr. 1954, p. 168-173.

Use of glass fiber as filler. Processing of resins. Applications for auto bodies. Photographs, diagram.

**11915*** (Reinforced Plastics.) **Gewapende kunststoffen.** W. H. Brinkman. *Plastica*, v. 7, no. 4, Apr. 1954, p. 178-181.

Production of asbestos and glass-fiber reinforced phenol resins; mechanical properties; applications. Photographs, tables. 4 ref.

**11916 Advances in Reinforced Plastics.** George Lubin and Maurice Martin. *Product Engineering*, v. 25, May 1954, p. 165-169.

Six resins and some reinforcements. Their design and fabrication. Photographs, tables.

**11917* Looking Forward. Atomic Radiation and Plastics.** Harry Barron. *Rubber and Plastics Age*, v. 35, Apr. 1954, p. 168-169.

Effects of atomic radiation on plastics and rubber.

**11918* Stress Cracking in Polyethylene Welds.** F. J. Bockhoff and J. A. Neumann. *SPE Journal*, v. 10, May 1954, p. 17-19.

Factors responsible for failure; prevention. Diagrams, photographs, tables. 11 ref.

**11919* High Impact Polystyrene Sheet.** F. J. McRae and W. D. Harris. *SPE Journal*, v. 10, May 1954, p. 22-25.

Materials, equipment, techniques, and applications. Photographs, diagrams.

**11920* Acrylonitrile Copolymer Blends in Pipes and Fittings.** Paul M. Elliott. *SPE Journal*, v. 10, May 1954, p. 26-28.

Properties, processing, and potentialities of blends of styrene-acrylonitrile copolymer resins with butadiene-acrylonitrile copolymer rubbers. Tables, graphs.

**11921* Styrene Acrylonitrile Copolymers.** J. S. Whitaker. *SPE Journal*, v. 10, May 1954, p. 30-33, 54.

Properties, processing, and applications. Photographs, tables.

**11922* Present and Future Applications of Heat Resistant Modified Polystyrene.** Charles J. Snyder. *SPE Journal*, v. 10, May 1954, p. 38-39, 50.

Includes photographs ,tables.

**11923*** (Roll Neck Bearings and Other Machine Elements Made of Molded Synthetic Resin Compounds.) **Walzenzapfenlager und andere Maschinenelemente aus Kunstharz-Pressstoff.** Walter Hensky. *Stahl und Eisen*, v. 74, no. 9, Apr. 22, 1954, p. 552-560.

Recent improvement in design. Economic efficiency. Tables, graphs, diagrams, photographs. 1 ref.

**11924* Mode of Reaction and Detection of Polyvinyl and Polyacrylic Compounds in Analysis of Finishes and Fibers.** (German.) H. Rath. *Textil-Rundschau*, v. 9, no. 4, Apr. 1954, p. 196-201.

Structural formulas of synthetic polymers. Identification reactions. Tables. 5 ref.

**11925* Matched-Die Molding of Reinforced Thermoplastics.** E. Y. Wolford. *Tooling and Production*, v. 20, May 1954, p. 82 + 3 pages.

Condensed from paper presented at 9th Annual Technical Conference of the Reinforced Plastics Division Society of the Plastics Industry. Process for forming thermoplastic articles by injection molding under pressure is characterized by rapid production of large quantities of molded pieces.

**11926*** ("Blown" Plastic Foil.) **"Geblasen" Kunststoff-Folien.** *Umschau in Wissenschaft und Technik*, v. 54, no. 9, May 1, 1954, p. 270.

Process for blowing thin polyethylene foil; application of method to polyvinylchloride and its mixed polymerides.

**11927* Resistant Materials for Handling Chemical Solutions.** L. R. Honnaker and M. L. Monack. *Water & Sewage Works (Reference and Data Edition)*, v. 101, May 1954, p. R173-R175.

Resistance of metal, plastic, and rubber-lined piping to alum, iron sulfate, activated silica, alkalies, Cl, and fluorides. Diagrams, tables.

**11928*** (Diffusion of Plasticizers in Polyvinyl Chloride.) **Diffusion von Weichmachern in Polyvinylchlorid.** Werner Knappe. *Zeitschrift für angewandte Physik*, v. 6, no. 3, Mar. 1954, p. 97-101.

Diffusion coefficient of 3 plasticizers at different concentrations and various temperatures. Tables, graphs, diagrams. 17 ref.

### *Books and Miscellaneous Publications*

**11929 Sandwich Construction.** N. E. Wahl. Paper from MATERIALS FOR PRODUCT DEVELOPMENT 1953. p. 93-101; disc., p. 108-116. Clapp & Poliak, Inc., N. Y. (TA403 M41.3)

Applies Fiberglas laminate-balsa wood system to helicopter blade construction. Compares advantages thereof. Diagram, graphs, table.

**11930 Insulating Materials.** A. J. Warner. Paper from MATERIALS FOR PRODUCT DEVELOPMENT 1953. p. 173-196; disc., p. 196-199. Clapp & Poliak, Inc., N. Y. (TA403 M41.3)

Reviews gaseous, liquid, and solid dielectrics, including polyethylene, Teflon, Kel-F, polystyrene. Graphs.

***See also:***

**10718** (glass fiber for reinforcing plastics)
**10833** (infra-red spectroscopy)
**10895** (stereoisomery of polymer chains)
**11042** (dielectric strength of plastic insulators)
**11257** (printing on vinyl film)
**11308** (resin-flow measuring system)
**11316** (plasticizing machine for plastics)
**11387** (injection molding machines)
**11417** (directory of non-metallic materials)
**11440** (Sn compounds in plastics)
**11445** (plastics for high-temperature service—book)
**11965** (rubber-plastic blends)
**11992** (freezing effects on cellulose fibers)
**12000** (plastic welding fixtures)

## POLLUTION AND WASTES

**11931* A Filter for Fine Aerosols.** Charles S. Keevil. *Armed Forces Chemical Journal*, v. 8, May-June, 1954, p. 32-34, 37.

Highly efficient filter cleans air to point where it is almost free of suspended matter. Photograph, drawing.

**11932* Removal of Radioactive Substances From Water by Biological Treatment Processes.** G. E. Eden, G. H. J. Elkins, and G. A. Truesdale. *Atomics (British)*, v. 5, May 1954, p. 133-142, 158.

Effectiveness of normal treatment methods of water and sewage in protecting domestic water supplies from radioactive contamination. Photograph, diagrams, graphs. 5 ref.

**11933*** (Flue Dust Removal.) **Rauchgasentstaubung.** M. Andritzky. *Brennstoff-Wärme-Kraft*, v. 6, no. 4, Apr. 1954, p. 122.

Electro-filters; cyclone dust removers; change in design of flue gas passages. Diagram, graph. 7 ref.

**11934* Use of Gas From an Electric Cast Iron Melting Furnace for Synthesis of Ammonia.** (French.) K. Tada. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques*, 1954, no. 3, p. 473-477.

Japanese Chemical Industry uses gas in synthesis of ammonium sulfate by Winkler process. Tables, graph.

**11935 Radioactive Wastes.** W. A. Rodger. *Chemical Engineering Progress*, v. 50, May 1954, p. 263-266.

Treatment, use, and disposal. Graphs, tables. 13 ref.

**11936* Determination of Fine Dust Contents of Air. A Survey of Measuring Devices and Measuring Methods.** (German.) D. Hasenclever. *Chemie-Ingenieur-Technik*, v. 26, no. 4, Apr. 1954, p. 180-187.

Survey of 30 devices for measuring health-impairing dusts below five $\mu$ diameter. Diagrams, micrographs. 5 ref.

**11937* Centrifuges. Separating Devices With Highest Separation Effect.** (German.) H. Trawinski. *Chemie-Ingenieur-Technik*, v. 26, no. 4, Apr. 1954, p. 189-201.

Permits sedimentations at increased gravitational constants and filtrations at increased ground pressure. Tables, diagrams, photographs. 33 ref.

**11938* Experimental Filters for Treating Cellulose Acetate Wastes Yield Encouraging Results.** L. W. Roznoy. *Civil Engineering*, v. 24, May 1954, p. 288-291, 358.

Principal wastes originate in recovery of $CH_3COOH$ and manufacture of acetic anhydride. Tests show economies can be achieved. Graphs, table.

**11939* Odor Studies With Cannery Wastes.** G. R. Ammerman and N. W. Desrosier. *Food Technology*, v. 8, May 1954, p. 253-257.

Objective method evaluates odor of decomposing cannery wastes. Methods of control evaluated. Tables, graphs. 20 ref.

**11940*** (Dust Measuring Process in German Coal Mining.) **Das betriebliche Staubmessverfahren im deutschen Steinkohlenbergbau.** Hans Breuer. *Glückauf*, v. 90, nos. 17-18, Apr. 24, 1954, p. 445-460.

Importance; technique and equipment for measuring concentration, grain-size distribution, and composition. Diagrams, photograph, charts.

**11941 Decontamination of Radioactively Contaminated Water by Slurrying With Clay.** William J. Lacy. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 1061-1065.

Includes photograph, graphs, tables. 9 ref.

**11942 Air Pollution in a London Smog.** E. T. Wilkins. *Mechanical Engineering*, v. 76, May 1954, p. 426-428.

Analysis of world's most disastrous smog incident causing 4,000 fatalities. Graph, chart, table. 4 ref.

**11943* Acid Mine Drainage. IV. Composition and Flow.** S. A. Braley. *Mechanization*, v. 18, Apr. 1954, p. 137-138.

Data obtained from sampling streams into which acid mine water is discharged. Demonstrates how data must be interpreted. Concludes that each mine must be studied separately to determine its own effect on stream pollution. Graph, tables.

**11944* Stream Pollution. Fungi in Polluted Water and Sewage. II. Isolation Technique.** Wm. Bridge Cooke. *Sewage and Industrial Wastes*, v. 26, May 1954, p. 661-674.

Formula for medium used in isolation of fungi from polluted water and sewage samples. Table. 8 ref.

**11945* Elimination of Odors in a Sulphate Pulp Mill.** Peitro Ghisoni. *Tappi*, v. 37, May 1954, p. 201-215.

Plant and it's main operations are described. Diagrams, tables. 12 ref.

**11946* Canning Plant Waste Problem Solved by Simplified Procedures.** R. S. Ingols, H. W. Hodgden, and H. E. Miller. *Water & Sewage Works*, v. 101, May 1954, p. 227-229.

Vibratory screening and nitrate treatment aids condition of low flow streams. Map, table, photograph, graphs.

**11947* Sewage Treatment Plant Equipment. I. Racks, Comminutors, Grinders, Triturators.** Frank L. Flood. *Water & Sewage Works (Reference and Data Edition)*, v. 101, May 1954, p. R234-R235.

Includes photographs.

***See also:***

**10644** (sewage sludge as fertilizer)
**10664** (oxidation of waste products)
**11035** (voltage control system for electrostatic precipitator)
**11816** (use of phosphatic slime)
**11831** (effects of coal cleaning on air pollution)
**11988** (adhesion of rubber to fabric)
**12029** (pulping of lumber waste)

## RUBBER AND ELASTOMERS

**11948* Rubber-Moulding.** *Aircraft Production*, v. 16, May 1954, p. 200-205.

Prototype and production molding, extruding, compounding, and vulcanizing. Photographs, diagrams.

**11949 Allyl Esters of Phosphonic Acids. III. Influence of Substituents on Polymerization Characteristics.** A. D. F. Toy and Robert S. Cooper. *American Chemical Society, Journal*, v. 76, Apr. 20, 1954, p. 2191-2195.

Glassy polymers do not always occur because steric hindrance, electrical behavior, and inhibitory groups affect reactions in these flame resistant polymers. Tables. 19 ref.

**11950 Determination of Particle Size Distribution in GR-S Latices.** Alfred Nisonoff, W. E. Messer, and L. H. Howland. *Analytical Chemistry*, v. 26, May 1954, p. 856-861.

Method based on Stokes' law, involves use of ordinary laboratory centrifuge. Data on various latices in plant production. Graphs, table. 16 ref.

**11951*** (Caloric and Thermal Properties of Natural Rubber in an Ordered and Disordered State.) **Kaloricheskie i termicheskie svoistva natural'nogo kauchuka v uporiadochennom i neuporiadochennom sostoianii.** B. I. Gengrinovich. *Doklady Akademii Nauk SSSR*, v. 95, no. 3, Mar. 21, 1954, p. 571-574.

Specific heat, heat expansion coefficient, and compressibility. Graphs, table. 5 ref.

**11952* Air Permeability of Elastomers by Diffusion Tests.** M. Czuha. *India Rubber World*, v. 130, May 1954, p. 207-210.

Equipment and procedure; accuracy and reproducibility; typical results. Diagram, photograph, tables, graphs. 4 ref.

**11953 Superfast GR-S Polymerization at 41°F.** J. R. Miller and H. E. Diem. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 1065-1073.

Materials, equipment, and techniques. Graphs, tables. 10 ref.

**11954 Sodium Formaldehyde Sulfoxylate in GR-S Polymerization.** R. W. Brown, C. V. Bawn, E. B. Hansen, and L. H. Howland. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 1073-1080.

Results of experiments with new initiator system. Tables, graphs. 10 ref.

**11955 Determination of Surface Area and Particle Size of Synthetic Latex by Adsorption. I. Latices Containing Fatty Acid Soaps.** Samuel H. Maron, Max E. Elder, and I. N. Ulevitch. **II. Latice Containing Rosin Acid Soaps.** Samuel H. Maron, Max E. Elder, and Carl Moore. *Journal of Colloid Science*, v. 9, Apr. 1954, p. 89-112.

Includes graphs, tables, diagram. 12 ref.

**11956 Flow Properties of Some Buna-N Solutions Under High Velocity Gradients.** E. W. Merrill. *Journal of Colloid Science*, v. 9, Apr. 1954, p. 132-140.

Flow properties of well milled Buna-N rubber in aniline solution show by means of $\tau$-D diagrams, effects of temperature,

## *Rubber and Elastomers*

concentration, and addition of benzene diluent. Graphs, table. 7 ref.

**11957* Chemistry in Carbon Black Dispersion.** Bernard C. Barton, Hugh M. Smallwood, and George H. Ganzhorn. *Journal of Polymer Science*, v. 13, May 1954, p. 487-498.

Contribution of chemical bonding to dispersion of carbon black. Effects on physical propetries of vulcanizates. Tables, graphs. 38 ref.

**11958* Colloid Science & Rubber Technology.** Ernst A. Hauser. *Journal of Scientific & Industrial Research*, v. 13, sec. A, Feb. 1954, p. 61-66.

Elastomers owe their properties to molecular configuration and to composition of colloid as a whole. Ultropak microscope is described. Micrographs, diagram. 13 ref.

**11959* Studies on Wear of Vulcanizates.** (German.) Walter Scheele and Karl-Heinz Hillmer. *Kautschuk und Gummi*, v. 7, no. 4, Apr. 1954, p. WT71-WT82.

Large-scale experiments with 4 types of rubber products on standard wear-testing device under controlled conditions. Tables, graphs. 12 ref.

**11960* Filler Strengthening and Structural Strength Considering Thixotropy.** (German.) R. Houwink and H. J. J. Janssen. *Kautschuk und Gummi*, v. 7, no. 4, Apr. 1954, p. WT82-WT86; disc., p. WT87.

Build-up of permanent resistance against repeated deformations in rubber. Table, graphs, diagrams.

**11961* Structure and Properties of Filled Rubber Mixtures. XXII. Dielectric Properties of Carbon Black-Natural Rubber Mixtures.** (Russian.) A. I. Lukomskaia and B. A. Dogadkin. *Kolloidnyi Zhurnal*, v. 16, no. 1, Jan.-Feb. 1954, p. 36-43.

Temperature and frequency curves of dielectric permeability and losses in unvulcanized rubber. Tables, graphs. 7 ref.

**11962*** (Properties of Silicone Rubber.) **Eigenschaften von Siliconkautschuk.** Manfred Wick and Wolf Dietz. *Kunststoffe*, v. 44, no. 4, Apr. 1954, p. 127-131.

Mechanical, electrical, and chemical characteristics. Tables, graphs, photograph. 32 ref.

**11963* Macromolecular Chemistry and Elastomers.** (French.) G. Champetier. *Revue générale du caoutchouc*, v. 31, no. 3, Mar. 1954, p. 210-216.

Motions of a macromolecule differ in nature according to temperature. Influence of lateral interactions on second-order transition temperature and on elasticity of polyamides. Tables, graphs.

**11964* Changes in Macromolecular Structure of Natural Rubber.** (French.) L. Bateman and W. F. Watson. *Revue générale du caoutchouc*, v. 31, no. 3, Mar. 1954, p. 217-222.

Calculated distribution functions for various polymer types. Significance and method of evaluation. Graphs. 14 ref.

**11965* Applications for Rubber Modified Styrene Molding Compounds.** Edwin V. Hellyar. *SPE Journal*, v. 10, May 1954, p. 34-37.

Toys, housewares, refrigerators, home freezers, air conditioners, housing, radio, television, and automotive batteries. Photographs.

**11966* Silicone Rubber as Cable Insulation.** J. F. Dexter and P. C. Servais. *Wire and Wire Products*, v. 29, May 1954, p. 516-520, 560-563.

Characterized by unusual thermal stability, fair electrical properties over a wide temperature range, and resistance to corona and weathering. Graphs, photographs, tables.

***See also:***
**11417** (directory of non-metallic materials)
**11909** (silicone rubber)
**11917** (effects of radiation on rubber)
**11920** (rubber-plastic blends)
**11927** (rubber-lined pipe for chemical solutions)

## SPACE HEATING AND CONDITIONING

**11967 Heating a Hotel.** *Coal-Heat*, v. 66, May 1954, p. 19-33.

Detailed examination of various fuel costs for heating, hot water, power, and laundry. Graphs, tables, photograph.

**11968* An Engineer's View of the Refrigeration Cycle. II.** W. G. Wassmandorff. *Commercial Refrigeration & Air Conditioning*, v. 11, May 1954, p. 52-55, 75-76.

Describes operating cycle. Diagrams.

**11969* Electric Modeling of Complex Nonlinear Heating and Ventilation Systems.** (Russian.) L. R. Neiman and V. F. Berednikova. *Elektrichestvo*, 1954, no. 3, Mar., p. 3-6.

Value of electric modeling operations in development of heating installations in cities and industrial enterprises. Diagrams, graphs. 5 ref.

**11970 Solar Heat Absorbers and Accumulators.** G. Vinaccia. *Engineers' Digest*, v. 15, Apr. 1954, p. 142-143. (Digested from *Revista di Ingegneria*, v. 3, nos. 11 and 12, Nov. and Dec. 1953, p. 1242-1246, 1365-1368.)

Design and possibilities of equipment for domestic and industrial heating. Diagrams. 3 ref.

**11971* Profits in Cooling. IV. Cooling Load Calculation Lets You Know How a House Will "Btu".** J. R. Lewis. *Fueloil & Oil Heat*, v. 13, May 1954, p. 97-99, 226, 228.

Facts to consider in determining size of unit needed for each job. Tables.

**11972 Air Cnditioning TV City.** F. A. Sayler and J. M. Ayres. *Heating, Piping & Air Conditioning*, v. 26, May 1954, p. 133-137.

Equipment, installation, and performance characteristics. Photographs.

**11973* The Festival Hall Heat Pump.** P. E. Montagnon and A. L. Ruckley. *Institute of Fuel, Journal*, v. 27, Apr. 1954, p. 170-186; disc., p. 186-192.

Development of various components; installation and operation. Diagrams, photographs, tables, graphs.

**11974* Ventilating the Atomic Energy Plant.** Thomas G. Marshall. *Refrigerating Engineering*, v. 62, May 1954, p. 39-42, 94, 96.

Successful control of radioactive gases and particles in processing of nuclear materials. Thorough air filtration is mandatory and elaborate safety precautions required. Photographs. 8 ref.

**11975* Refrigeration Nomenclature for Text and Drawings. Part D: Definitions.** (Proposed American Standard.) *Refrigerating Engineering*, v. 62, May 1954. 28 pages.

## TEXTILES AND FIBERS

**11976* 1953 Annual Convention.** *American Dyestuff Reporter*, v. 43, May 10, 1954, p. 296-314.

Includes "Dynel 'Inner Structure' ", T. A. Feild, Jr., C. A. Setterstrom, and C. W. Davisson; "Better Mercerizing for Improved Luster", Lyman Fourt and Arnold M. Sookne; and "The Behavior of Optical Bleaching Agents on Cellulosic Materials", S. N. Glarum and S. E. Penner. Photographs, tables, graphs. 19 ref.

**11977* Symposium on Fiberglas Textiles. The Finishing, Dyeing and Printing of Glass Decorative Fabrics.** R. F. Caroselli. **Glass Fibers—Chemical Characteristics and Coating Techniques.** Alfred Marzocchi. **New Industrial Applications of Fiberglas Textiles.** Richard C. Horton. *American Dysetuff Reporter*, v. 43, May 24, 1954, p. P327-P330.

Includes Coronizing process, behavior with heat, and uses. Diagram.

**11978* Surface-Active Agents and Their Far-Reaching Influence in the Textile Industry.** P. J. Sullivan. *American Dyestuff Reporter*, v. 43, May 24, 1954, p. P331-P334.

Specific applications of synthetic detergents in textile processing.

**11979* Adsorption of Detergent in the Dyeing Process.** Lawrence Flett and L. F. Hoyt. *American Dyestuff Reporter,* v. 43, May 24, 1954, p. P335-P338.

Quantitative amounts of synthetic detergent adsorbed on wool at different stages in process. Tables, graphs. 2 ref.

**11980 The Kinetics of Acid Absorption on Wool Fibres.** R. F. Hudson. *Faraday Society, Discussions,* no. 16, 1954, p. 14-24.

Results of varying concentration of acid in solution, temperature, degree of agitation, and nature of anion. Graphs, tables. 21 ref.

**11981 The Kinetics of Absorption of Water and Aqueous Solutes by Dry Viscose Cellulose.** H. B. Mann and T. H. Morton. *Faraday Society, Discussions,* no. 16, 1954, p. 75-84.

Final result in pad-dyeing on amount of dye taken up while fabric is immersed in dye liquor. Graphs, tables. 7 ref.

**11982 Researches on Monolayers. IV. A Study of Dyeing Processes by the Use of the Unimolecular Film Balance.** Margaret M. Allingham, C. H. Giles, and E. L. Neustädter. *Faraday Society, Discussions,* no. 16, 1954, p. 92-105; disc., p. 105-124.

Possible modes of dye-fiber combination studied by determination of effect of dyes, or model compounds, as solutes in aqueous layer below monolayers of a variety of surface-active compounds. Graphs, tables. 16 ref.

**11983 The Selective Absorption of Optical Antipodes by Wool.** W. Bradley, R. A. Brindley, and G. C. Easty. *Faraday Society, Discussions,* no. 16, 1954, p. 152-158.

Affinity characteristic of acid dyes. Tables. 19 ref.

**11984* The Structure and Optical Behaviour of Some Natural and Synthetic Fibres.** C. V. Raman and M. R. Bhat. *Indian Academy of Sciences, Proceedings,* v. 39, sec. A, Mar. 1954, p. 109-116 + 6 plates.

Optical diffraction pattern of single fibers using beam of sunlight. 4 ref.

**11985* The Camera Lucida.** Itzhak Zagiel. *Modern Textiles Magazine,* v. 35, May 1954, p. 31, 64, 66-67.

Application to evaluation of fabric construction. Photograph, diagrams.

**11986* What You Should Know About the Effects of Electricity in Textiles.** J. W. S. Hearle. *Modern Textiles Magazine,* v. 35, May 1954, p. 32-33, 68-70.

Includes graphs, tables, diagrams. 9 ref.

**11987 Special Treatments for Wool Felt.** Leon D. Gruberg. *Product Engineering,* v. 25, May 1954, p. 194-197.

Impregnations, proofings, coatings, and laminations. Photographs, tables.

**11988*** (Interaction of Fiber and Rubber in Rubber-to-Fabric Adhesion.) **L'interaction des fibres et du caoutchouc dans l'adhérence du caoutchouc anx tissus.** W. C. Wake. *Revue générale du caoutchouc,* v. 31, no. 4, Apr. 1954, p. 299-302.

Tests separate previously bonded materials. Graphs. 4 ref.

**11989* Here's How Mill Processing Affects Cotton Cellulose.** Robert F. Schwenker, Jr. and John C. Whitwell. *Textile Industries,* v. 118, May 1954, p. 104-107.

Techniques of changing molecular weight. Mechanical and chemical processing. Table, graphs. 5 ref.

**11990* The Use of the Zellweger Irregularity Tester in Finding the Variance-Length Curve of Worsted Yarn.** P. Grosberg and R. C. Palmer. *Textile Institute, Journal, Transactions,* v. 45, Apr. 1954, p. T275-T290.

Mode of action of integrator supplied with tester is examined analytically. Tables, diagram. 4 ref.

**11991* A New Method for Differentiation of Skin and Core of a Rayon Filament.** W. Rhett Berry. *Textile Research Journal,* v. 24, May 1954, p. 397-399.

Technique stains skin of rayon filament; determines skin area. Photographs. 2 ref.

**11992*** (Freezing of Cellulose Fibers.) **Zamorazhivanie tselliuloznykh volokon.** N. I. Klenkova. *Zhurnal Prikladnoi Khimii,* v. 27, no. 4, Apr. 1954, p. 433-444.

Influence on properties. Importance in agriculture and processing. Tables, graph. 22 ref.

***See also:***
**10778** (production of ion exchange fabrics)
**10782** (properties of rayon fibers)
**10926** (physical chemistry of dyeing)
**10927** (stereochemical problems in dyeing)
**11294** (tester for textiles)
**11327** (force measurement in fibers)
**11797** (sampling of yarns and fabrics)
**11894** (dyeing of polyethylene terephthalate)
**11895** (high polymer fibers)
**11897** (crystallization of fibers)
**11898** (properties of Saran fibers)
**11899** (synthetic fibers)

## WELDING AND JOINING

**11993* Electric Resistance Welding of Light Alloys.** (German.) G. Moressée. *Aluminium,* v. 30, no. 4, Apr. 1954, p. 152-157.

Classification of welds. Importance of parameters. Graphs, diagrams.

**11994 Subcommittee Report on New Specification for Bare Stainless Steel Welding Rods and Electrodes.** *ASTM Bulletin,* 1954, no. 198, p. 77-80.

Applicable to filler metals for a wide variety of processes. Diagrams, tables. 1 ref.

**11995 Rsearches on Welded Pressure Vessels and Pipelines.** Nicol Gross. *British Welding Journal,* v. 1, Apr. 1954, p. 149-160.

Strain measurements in pressure vessels, in connection with stress peaks in drumheads and around large openings such as nozzles. Diagrams, tables, photographs, graphs. 29 ref.

**11996 Hydrogen—Barrier to Welding Progress.** C. L. M. Cottrell. *British Welding Journal,* v. 1, Apr. 1954, p. 167-176.

Sources of H and effect on mechanical propetries of steels. Tables, graphs, photographs. 25 ref.

**11997 Tentative Code of International Smybols for Designating Covered Electrodes for Arc Welding of Mild and Low-Alloy High-Tensile Steels.** *British Welding Journal,* v. 1, May 1954, p. 205-208.

Guide which may be adopted by all countries, describes electrodes by means of symbols. Tables, diagrams.

**11998 Resistance Welding of Coated Steels. A Review of Information.** J. E. Roberts. *British Welding Journal,* v. 1, May 1954, p. 233-237.

A review of Cd-, Pb-, Sn-, Zn-, Al-, and Cu-coated steels. Tables, graphs. 17 ref.

**11999*** (Welding of Gray Iron.) **Schweissen von Grauguss-stücken.** L. Queck. *Giesserei,* v. 41, no. 9, Apr. 29, 1954, p. 242-243.

Procedures for electric and gas welding. Diagrams, table, graph.

**12000 Plastic Welding Fixtures Cost Little, Assure Accuracy.** A. P. Challenger. *Iron Age,* v. 173, May 6, 1954, p. 124-125.

Fixtures made of cast phenolic resin offer a substantial cost advantage over metal fixtures. Photographs.

**12001 Welding Tubes to Tube Sheets.** H. A. Huff, Jr. and A. N. Kugler. *Mechanical Engineering,* v. 76, May 1954, p. 421-425, 433.

Brazing process used on tubes of unfired heat-transfer equipment. Diagrams, chart, photograph. 9 ref.

**12002* Adhesion Policy for the Foil Converter. I.** Frank C. Campins. *Paper, Film and Foil Converter,* v. 28, June 1954, p. 17-19.

Sets forth clear policy for foil converter. Photographs. (To be continued.)

## *Welding and Joining*

**12003* Design of a Metal-to-Plastic Joint That Resists Stress.** W. E. Cummings. *Precision Metal Molding*, v. 12, May 1954, p. 38-39, 92-93.

Solution to problem of inserting a molded plastic piece between two metal end connectors to resist torque, internal pressure, and tensile stress. Photographs.

**12004*** (Fatigue Behavior of Aviation Landing Gear. Experimental Comparison Between Joining by Rivets and Gluing.) **Comportement en fatigue des timoneries d'avion.** D. Clerc and M. Bogaievsky. *Recherche Aéronautique*, 1954, no. 38, Mar.-Apr., p. 57-62.

Gluing may show greater mechanical strength. Tables, diagrams, graphs. 10 ref.

**12005*** (Machine Riveting of Light Metals.) **Le rivetage a la machine des métaux légers. II.** B. Adaridi. *Revue de l'Aluminium*, v. 31, no. 209, Apr. 1954, p. 167-171.

Design of hydraulic-pneumatic machine with coupled generator and receiver. Diagrams, photographs.

**12006* Structural Adhesives for Metal Aircraft. II. Sandwich Structures.** N. A. De Bruyne. *Rubber and Plastics Age*, v. 35, Apr. 1954, p. 182-183.

Includes diagrams, photographs, graph. 11 ref.

**12007* Rationalization in the Production of Bicycles and Light-Weight Motorcycles by Resistance Welding.** (German.) H. Kleine-Weischede. *Schweissen und Schneiden*, v. 6, no. 4, Apr. 1954, p. 142-145.

Increased economy in industrial application. Photographs, diagrams.

**12008 Automatic Arc and Resistance Welding as Applied to Sheet and Strip Metal.** J. A. Dorrat. *Sheet Metal Industries*, v. 31, no. 325, May 1954, p. 391-403.

Automation of welding processes. Photographs, tables, diagrams, graph. 11 ref.

**12009 Glues and Gluing. XXXVI.** *Southern Lumberman*, v. 188, May 15, 1954, p. 51-52, 54, 76.

Operation of hydraulic steam-heated edge-gluing lumber press. Photographs.

**12010* Welding High-Temperature Materials.** Francis H. Stevenson. *Tool Engineer*, v. 32, June 1954, p. 73-76.

Fusion and resistance welding. Gives choices for particular temperature range. Photographs, graph, table. 2 ref.

**12011*** (New Processes for Welding Metals.) **Neue Verfahren zur Verschweissung verscheidener Metalle.** *Umschau in Wissenschaft und Technik*, v. 54, no. 9, May 1, 1954, p. 275.

Welding pieces not exceeding 1 $cm^2$ by means of a condensor impulse discharge. Experiments on W with constantan, German silver, Cu, Pb, Al, and Bi; Al with Cu; cermet with steel; and Pb with steel. Photographs.

**12012 The Effect of Alloying Elements on Welds in Titanium.** G. E. Faulkner, G. B. Grable, and C. B. Voldrich. *Welding Journal*, v. 32, Oct. 1953, p. 481S-497S.

Effects of Fe, Mn, Cr, and Mo on mechanical and metallurgical properties of welds in Ti. Tables, diagrams, photographs, graphs, micrographs. 2 ref.

**12013 Investigation of Structural Failures of Welded Ships. I. Examination of Samples and Analyses of the Failures.** Morgan L. Williams and George A. Ellinger. *Welding Journal*, v. 32, Oct. 1953, p. 498S-527S.

Samples of fractured plates from 100 ships were examined. Tests on 130 selected plates are analyzed. Photographs, tables, micrographs, graphs. 25 ref.

**12014 Tolerance and Control on Fillet Welds.** John Mikulak and Merle Dillman. *Welding Journal*, v. 33, May 1954, p. 449-458.

Welding procedure control insures suitable joint quality in use of manually operated semiautomatic submerged-arc process. Photographs, graphs, diagrams.

**12015 Austenitic Manganese Steel Welding Electrodes.** Howard S. Avery and Henry J. Chapin. *Welding Journal*, v. 33, May 1954, p. 459-479; disc., p. 479.

Properties and welding techniques for use of Mo-Mn electrodes in repair and hard facing of Mn steel parts and for miscellaneous hard-facing applications. Micrographs, graphs, tables, diagrams, photograph. 18 ref.

**12016 Working Conditions Ambient to Inert-Gas-Shielded Metal-Arc Welding.** Leslie Silverman and Harry Gilbert. *Welding Journal*, v. 33, May 1954, p. 218S-229S.

Gas and fume concentrations and control of operator exposure. Spectrogram, tables, photographs. 26 ref.

**12017 Heavy Armoured Vehicle Fabrication.** J. W. Brind. *Welding and Metal Fabrication*, v. 22, May 1954, p. 166-173.

Welding of tank armor plate and castings. Photographs, diagrams.

**12018 Atomic Hydrogen Welding in the Chain-Making Industry.** A. T. P. Black. *Welding and Metal Fabrication*, v. 22, May 1954, p. 174-177.

Care to insure a correct choice of filler wire, good welding technique, and complete protection of weld metal in its fluid state from atmospheric contamination. Micrographs, photographs. 2 ref.

**12019 Automatic Welding and Rapid Erection of Spherical Pressure Vessels in Russia.** A. S. Fal'kevich and M. B. Gann. *Welding and Metal Fabrication*, v. 22, May 1954, p. 178-181. (Translated from *Avtogennoe Delo, Moscow*, v. 23, no. 3.)

Used on storage tanks for petroleum products. Photographs, diagrams, tables.

**12020 Automatic Welding of Light-Gauge Fabrications.** Rowland Gardener. *Welding and Metal Fabrication*, v. 22, May 1954, p. 184-187, 193.

Plate preparation and correct jigging achieve good results. Photographs, diagrams.

***See also:***
**10963** (coatings over welds)
**11418** (properties of Ti weldments)
**11918** (welding of plastics)

## WOOD AND FOREST PRODUCTS

**12021* Stock Preparation.** *Paper Mill News*, v. 77, May 15, 1954, p. 45 + 21 pages.

Includes "The Beater", L. E. Randecker; "The Effect of Roll Pressure and Time"; "The Effect of Roll Speed"; "The Effect of Roll Speed, Roll Feed and Roll Pressure on Power"; and "Conclusion". Tables, graphs.

**12022* The Concept of Balanced Treatment of Pulp and Operation of Hydrafiners and Jordans.** W. A. White, Jr. *Paper Mill News*, v. 77, May 15, 1954, p. 88 + 11 pages.

Design of machinery for treatment of pulp and paper making fibers. Photographs, graphs, diagrams, micrographs.

**12023* Report on Closed Hood Installations at Iroquois Falls.** J. C. Jordan. *Paper Trade Journal*, v. 138, Apr. 30, 1954, p. 14-19.

Improvements in paper making machines. Photographs, diagrams, tables, graphs. 3 ref.

**12024* Conservation Achieved Through Integration of Sawmills and Pulp.** Leander Manley. *Pulp and Paper Magazine of Canada*, v. 55, May 1954, p. 92-95.

British Columbia's primary mills now fully integrated to effect economies in processing and utilization of their forest resources. Photographs, drawing.

**12025* The Use of a Betameter for Newsprint Basis Weight Control.** C. S. Waddell. *Pulp and Paper Magazine of Canada*, v. 55, May 1954, p. 109-114.

Results of trial installation. Photographs, graphs. 4 ref.

**12026* Current Practices of Slime Control.** W. E. Patte. *Pulp and Paper Magazine of Canada*, v. 55, May 1954, p. 120-124.

A report to 1953 Testing and Control Committee, Technical Sec., C.P.P.A.

**12027* Peroxide Bleaching of Sulphate Pulp.** Kenneth G. Aitken. *Pulp and Paper Magazine of Canada*, v. 55, May 1954, p. 125-130.

Preparation of peroxide solution, variables associated with method, and results obtained on laboratory scale. Tables, graphs, diagrams.

**12028* A Comparison of Processes for the Generation of Chlorine Dioxide in Pulp Mills.** W. Howard Rapson. *Tappi*, v. 37, Apr. 1954, p. 129-137.

Capital cost; raw material requirements; maintenance difficulties; ease of start-up, shut-down, and change of production rate; simplicity of control; and explosion hazards. Compares chemical reactions, equipment requirements, materials of construction, operating problems, material balance, and relative cost of $ClO_2$ for various processes. Diagrams, tables. 14 ref.

**12029* Continuous High-Yield Kraft Pulping of Douglas-Fir Lumber Waste.** D. J. MacLaurin and J. F. Whalen. *Tappi*, v. 37, Apr. 1954, p. 143-147.

Range of 60 to 70% yield Douglas-fir kraft pulps were prepared from hammer-milled box ends and chipped slabwood, tops, limbs, and logs. Photographs, tables, graphs. 14 ref.

**12030* The Continuous Preparation and Application of Silica Sols in the Paper Industry.** L. L. Klinger. *Tappi*, v. 37, May 1954, p. 191-195.

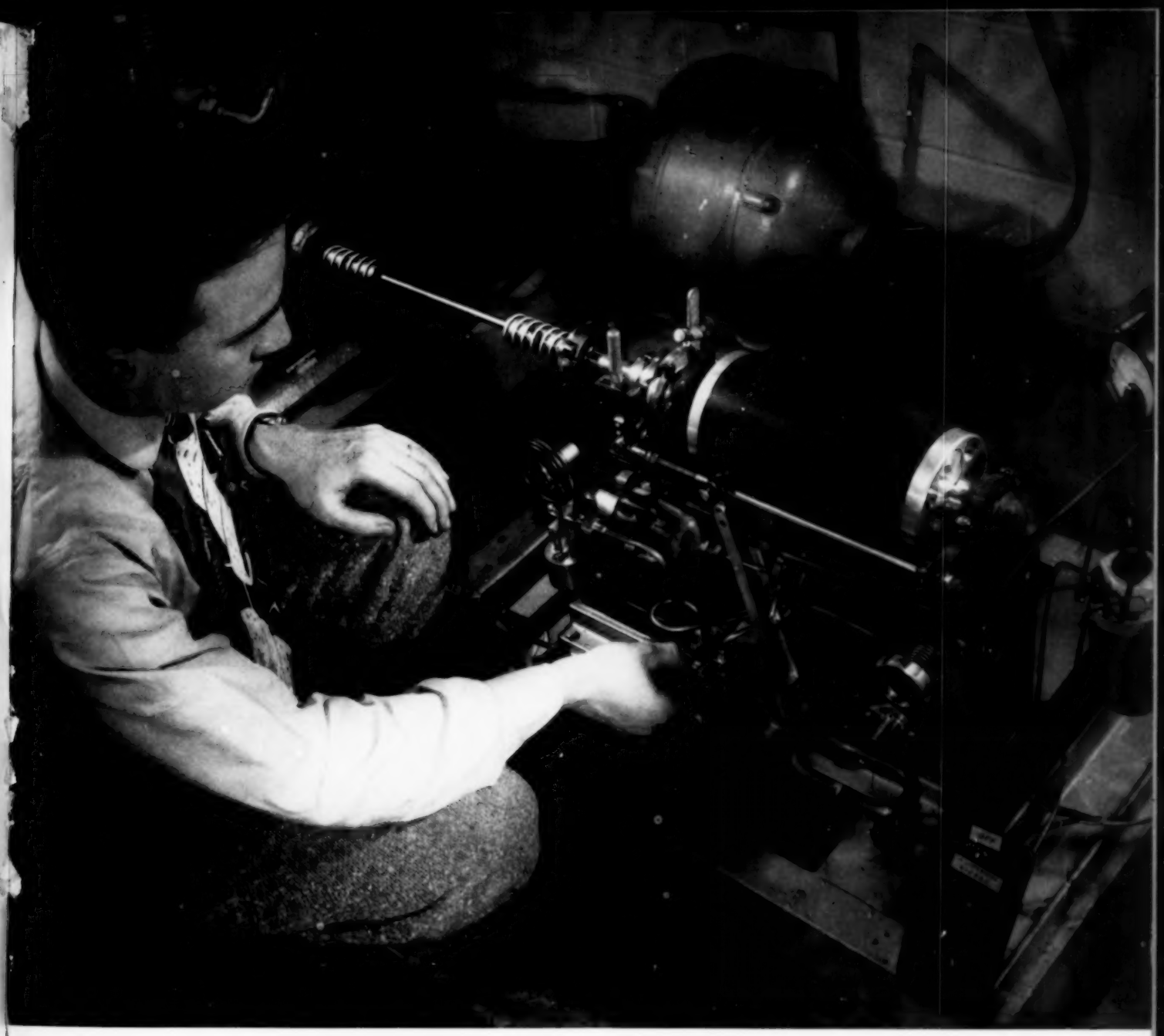
Theory and method of activation; independent continuous feed development; industrial use of the silicator. Diagrams, photographs, graph, table. 19 ref.

**12031* Pulp, Paper, and Board in the United States. Review for 1953.** W. Leroy Neubrech. *Tappi*, v. 37, May 1954, p. 70A + 14 pages.

Includes tables, graphs.

***See also:***

**11945** (sulphate pulp mill operations)



STUDY OF ENGINE PERFORMANCE

The apparatus being adjusted by the engineer records electrically the sequence of events in an internal-combustion engine. The "engine indicator" makes a graphic record of the average of the events in a large number of cycles. The resulting data permits the engineer to analyze the breathing characteristics of the engine, evaluate the ignition and its effects on the cycle, and study the effects of other variables on the engine's performance.

BATTELLE MEMORIAL INSTITUTE was founded by the will of Gordon Battelle as a memorial to the Battelle family. The Battelles were among the first settlers of Ohio and were prominent in the development of the state's iron and steel industry.

Gordon Battelle, last of the family line, was impressed with the benefits to be derived from industrial research and left his estate for the building and endowment of an Institute "for the purpose of education . . . the encouragement of research . . . and the making of discoveries and inventions for industry." The Institute began operations in 1929.

As established, Battelle provides, on a not-for-profit basis, the physical plant, equipment, and personnel for conducting research. The great bulk of it is applied research conducted for industry and government.

In keeping with its educational function, the Institute also conducts fundamental or basic research. The results of much of this research are published to encourage science and industry and to benefit the public welfare.

## FIELDS OF RESEARCH

CHEMICAL ENGINEERING — INDUSTRIAL PHYSICS — METALLURGY

CHEMISTRY — PLASTICS, RUBBER AND PAINTS

CERAMIC TECHNOLOGY — NUCLEONICS — WELDING TECHNOLOGY

GRAPHIC ARTS TECHNOLOGY — ELECTROCHEMISTRY

ENGINEERING ECONOMICS — ELECTRONICS — MINERAL PROCESSING

FUELS AND COMBUSTION — ELECTRICAL ENGINEERING

INFORMATION PROCESSING — BIOCHEMISTRY — OPERATIONS RESEARCH

MECHANICAL ENGINEERING — AGRICULTURAL SCIENCES

THEORETICAL AND APPLIED MECHANICS

### Battelle Laboratories

505 King Avenue
Columbus 1, Ohio, U.S.A.

7 route de Drize, Carouge,
Geneva, Switzerland

Wiesbadnerstrasse
Frankfurt/Main, W 13, Germany

North Florida Research Station
Daytona Beach, Florida, U.S.A.

### Offices

46 Bryanston Street
London, W 1, England

53, Avenue George V
Paris VIII, France

Suite 1124, Du Pont Circle Bldg.
1346 Connecticut Avenue
Washington 6, D. C., U.S.A.

Corso Matteotti 10
Milan, Italy

3, rue du Mont Blanc
Geneva, Switzerland

VOLUME 3, NUMBER 9 SEPTEMBER 1954